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Amateur Radio

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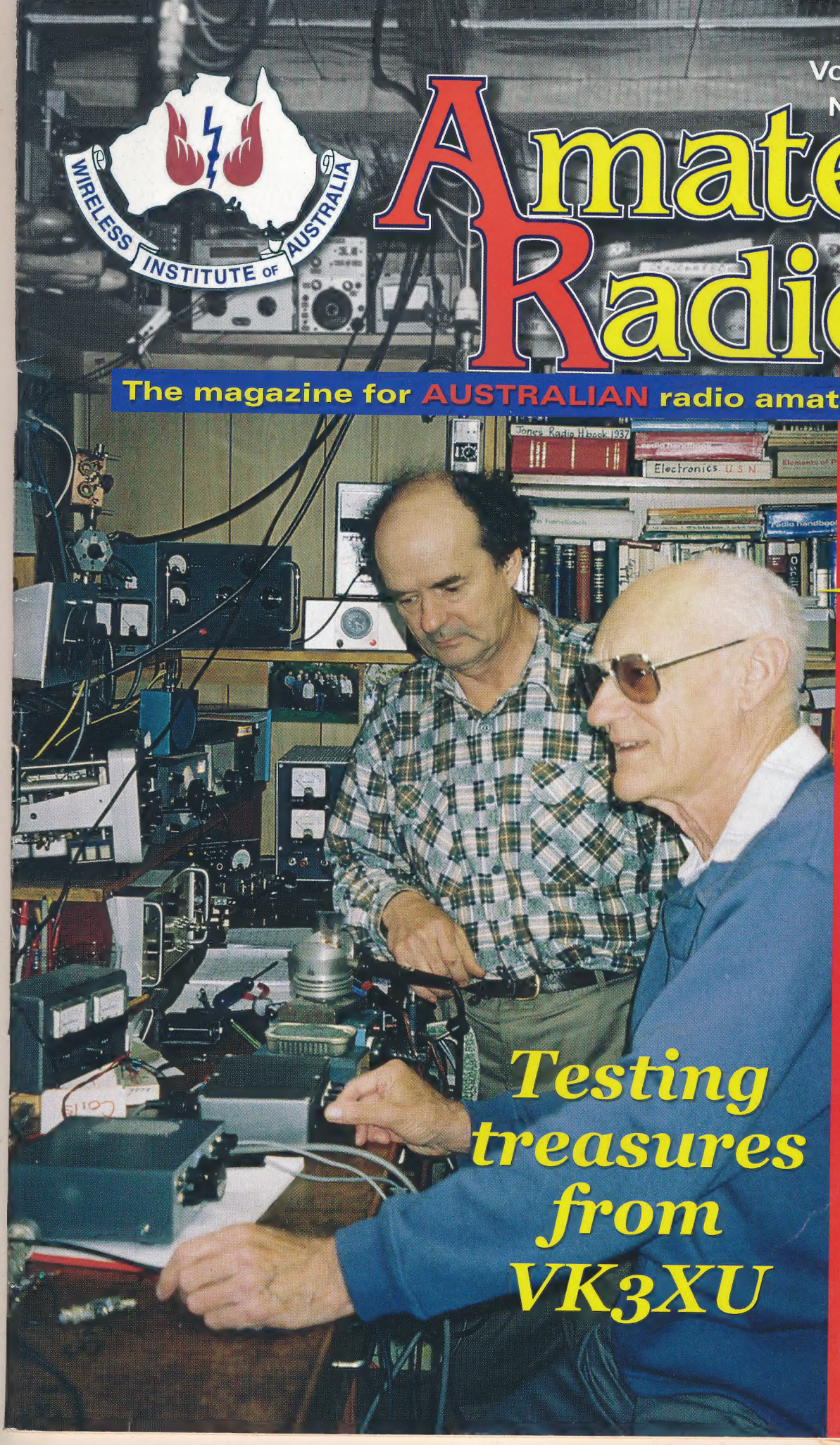
The magazine for AUSTRALIAN radio amateurs



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Our Cover this month

Drew Diamond VK3XU and Max Riley VK2ARZ at the QTH of Drew trying out the latest 3XU QRP portable transceiver yet to be described.We look forward to hearing more! Photo by Andrew Diamond

Contributions to Amateur Radio
Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues
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Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society
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Representing
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Member of the
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Editorial comment

Colwyn Low VK5UE

Foundation Licence

The Foundation Licence has arrived and the first ones issued. The revised licensing structure has been promulgated and we now have a three-tier structure: Foundation, Standard and Advanced. We can all talk to each other using the basic modulation modes on most bands, so when you get a call from a new entrant who will have a four letter call please welcome them and give them all the help you can. Most likely the first thing to do is reply to calls on repeaters. There are lots of stories about amateurs on holiday who have announced their presence on a repeater and not got any replies. While an old hand can accept this, a new licenSee will think they are doing something incorrect or worse feel they are not worth talking to and soon give up.

PLEASE MAKE SURE THE NEW LICENSEES ARE MADE WELCOME.

Articles in *Amateur Radio*

Amateur Radio magazine has been criticised in some recent letters to me as editor. Some of the criticism I accept as valid and we were in error or even a bit LAX in our vetting. However we do need to make some allowances for new authors and their possible lack of knowledge. We should not have let some of these errors through, as their publication diminishes the standing of AR and the WIA.

Now AR is written by members of the WIA and readers who buy it on the newsstands. I can only choose from what has been submitted when I assemble an issue of AR. My present choice is from about 30 articles. I need more material on both technical and general themes. An article on a piece of equipment you have built used or modified. An article about a club activity or your own Field Day experiences would be welcome. For the next few months we will have to republish our own old material or material from our sister overseas amateur society magazines. Please think about writing something for AR yourself or encourage someone to write about something they have, or have made or have done using amateur radio.

When I was learning basic science at school we progressed by steps. When you went on you were told "Earlier we told you this but that is the basic explanation and you need to go deeper". In October AR on page 5 we published Hayden Honeywood VK7HAY's article on a simple dipole. It was quick and simple and many of us have used this design as a temporary solution to an aerial problem or as a Field Day aerial. However if you now read on in this issue on page 24 you will learn that the simple aerial has some problems. Even if you use this new information you can still have problems because in a typical modern backyard no dipole aerial will have both sides in exactly the same environment. The house will couple to one side and the big gum tree to the other. However with a bit of careful trimming or maybe just a good aerial matcher you can get it to work acceptably.

Our explanations of things are limited by our previous learning both formal and experimental. They get us by but are not exact. Our technical editors try to ensure our published articles are correct to at least a TAFE College certificate standard without rewriting the whole article. This sometimes annoys the purists but then not all amateurs have the benefit of a Technical College or a University education in radio communications. So please continue to tell us when we make fundamental errors. When we do not go deep enough please write a letter to the editor making the more detailed explanations available to everyone.

That is all for this month

73 Colwyn VK5UE

WANTED URGENTLY

Articles for Amateur Radio

Technical, club activities, DXpeditions, Field Days, opinion, or whatever your experience is or has been in amateur radio

Address for submitting articles can be found on page 1

Michael Owen VK3KI

That Was the Week that Was!

On 19 October 2005 the new Australian amateur licence structure came into effect. It is briefly described in the WIA's release published the day before, after ACMA's Determination under the Radiocommunications Act was registered, so fixing the commencement time.

Part of that release which summarises the new licences is reproduced in the News column in this AR.

These changes are the most significant for very many years, and follow the removal of Morse code as a requirement for all amateurs licensed below 30 MHz by the ITU's World Radiocommunications Conference, Geneva, 2003. The 5 amateur licensing options were no longer necessary and could be replaced by two, with a new entry level licence.

The Foundation Licence is the new gateway to amateur radio.

The ACA in its "Outcomes of the Review of Amateur Service Regulation", May 2004 reported that over two-thirds of all submissions were in favour of the introduction of a foundation licensing option, similar to the foundation licence in the United Kingdom. The "Outcomes" paper also said that the most common reason given for the support was the need to make the amateur service more accessible to potential amateurs, who they believed found the existing novice theory examination too difficult.

The Foundation qualification places emphasis on the safe operation of radio equipment, and includes the assessment of a practical element involving the operation of transmitters and receivers and a multiple choice written paper covering safety, operational and regulatory matters.

To meet the requirement for a practical element the WIA has introduced a new system of assessment of competency for the qualifications for the new licences, relying on qualified, accredited and registered WIA Assessors, who can undertake the practical assessment and also mark the examination papers. Over 70 people have qualified, either by attending one of the training courses conducted in Adelaide, Brisbane, Melbourne or Sydney, or by existing qualifications and have been accredited and registered by the WIA as WIA Assessors.

The WIA Assessors have in almost every case been nominated by a WIA Affiliated Club, and will be assisted by other members of the club involved in the examination process, either as Invigilators or as Group Leaders. Indeed, in the short run, clubs currently without a WIA Assessor will be seeking the assistance of other WIA Assessors in their training courses.

In addition, the WIA will be publishing in November a 96 (or so) page full colour book, "Your Entry into Amateur Radio – The Foundation Licence Manual", setting out all a candidate needs to know to qualify for the Foundation Certificate of Proficiency.

The first Foundation Licence Training course was conducted by the Gold Coast Amateur Radio Society over the weekend of 15 and 16 October 2005, with 16 candidates assessed as competent, and with the first Foundation Licence issued on 21 October 2005, VK4FRST. The News column has more information about VK4FRST.

We are being asked by many people, how do I get a Foundation licence?

The answer is to contact your closest radio club, and see what they are doing.

But, we do need to say that it is very important that, before we encourage the WIA Assessors and their clubs to train and assess as many candidates as possible, we make sure that we have identified and addressed any potential problems that could cause.

As I write this, the first course was conducted just over a week ago.

We are still evaluating what we learnt from that course, both at the course and preparing the Foundation Assessment Packs and processing the results.

What we learnt has to be incorporated in changed forms and procedures, which means a second revision of the Assessment Instructions.

Then one thing that we did learn from the first course was how important it was to have the right material for the course, and we do not know precisely when "Your Entry into Amateur Radio – The Foundation Licence Manual" will be available.

We have also learnt that it is a mistake to ask a new assessor to try to do too much too soon.

We must avoid putting our new assessors in a position where they are asked to assess too many candidates too quickly so that they make mistakes. That is why at this stage we are restricting the number of Foundation Assessment Packs that a WIA Assessor can hold to not more than than10.

Whatever we do, we must balance the obvious pressure from many people enthusiastic to obtain the Foundation licence qualification against the need to ensure that the system retains full credibility

So, I urge every club to look very hard at how it is responding to the undoubted new interest in amateur radio and the demand for Foundation licence training and assessment.

Another thing is also obvious.

There are many clubs that would like to have, because of their size, more assessors and there are clubs that have not yet had any assessors qualified and would now like to have their own assessors.

Of course the WIA will conduct further assessor training courses. I don't know where and I don't know when. But it will be as centrally located as possible, and we will be asking the clubs to send their potential assessors for training and qualification.

But, to enable us to judge the need, we are asking every club wishing to nominate a candidate for qualification to complete and forward to the office an Application for Assessor Training form.

I think that the last week has been one of the most exciting and important weeks ever in amateur radio in Australia, at least for very many years.

I believe that the WIA has led the way to a new amateur radio.

My concern is that we build on what we have. In effect, we hasten slowly, recognising the damage we could do if we make mistakes, but seek above all else to establish and maintain the credibility of what we have created.

ar

WIA News

New amateur licences come into force

At the first moment of Wednesday 19 October 2005 the new Australian amateur licence structure came into force.

At that time, the Determination made by the Australian Communications and Media Authority amending the Amateur Licence Conditions Determination became the law.

What does it mean?

It means that as from that time the Foundation licence exists.

The first Foundation Licences were issued by the end of that week, to those who qualified at the trial Foundation training course conducted by the Gold Coast Amateur Radio Society on the weekend of 15 and 16 October.

The amateur Foundation licensee can only use a transmitter that has been manufactured commercially, can only use voice, on either SSB, AM or FM or morse using a manually operated morse key, and not more than 10 watts output power SSB or 3 watts output power AM, FM or CW.

The Foundation station can operate on the 80, 40, 15 and 10 metre bands as well as the 2 metre band and the band 430 to 450 MHz, subject to necessary bandwidth restrictions.

It means that the Standard licence now exists, and this licence includes the existing Novice, and Novice Limited licensees, who now can use any emission mode with a necessary bandwidth not exceeding 8 kHz on the 80, 40, 20 and 15 metre bands, and any emission mode with a necessary bandwidth not exceeding 16 kHz on the 10 metre band, the band 52 to 54 MHz, the 2 metre band, and the bands 430 to 450 MHz, 1240 to 1300 MHz, 2,400 to 2,450 MHz and 5.650 to 5.850 GHz, with no change to the current output power limits of 100 watts and 30 watts.

It means that the Advanced licence exists, and this licence includes the existing Unrestricted licence, the Limited licence and the Intermediate licence. These licensees can use any emission mode with a necessary bandwidth not exceeding 8 kHz on all bands below 24.990 MHz, any emission mode with a necessary bandwidth not exceeding 16 kHz on the 28.00 MHz to 29.70 MHz band, any emission mode with a necessary bandwidth not exceeding 100 kHz on the 6 and 2 metre bands and any emission mode with no bandwidth restriction above 420 MHz, and with no change to the current output power limits of 400 watts and 120 watts.

Full details of the Determination and other administrative details including the arrangements being made by ACMA to substitute new licences for existing licenses can be found at the ACMA website, www.acma.gov.au, then Consumer, Radio Operators, About amateur radio ? and all amateurs are urged to check that site for the full and authoritative information.

First WIA 5 Band DXCC and First WIA 9 Band DXCC Awarded

On 21 October 2005, at the Moorabbin and District Radio Club meeting, David McAuley, VK3EW, received both his WIA 5 Band DXCC and WIA 9 Band DXCC certificates from WIA President, Michael Owen, VK3KI.

Michael paid tribute to National Awards Manager, Mal Johnson, VK6LC, who had taken the opportunity presented by the restructure of the WIA to not merely remove the word "Federal" from the awards, but to create a whole range of new, exciting and attractive awards.

A 9 band DXCC is no small achievement. 100 stations in 100 countries 9 times over are, as the certificate says, 900 countries! To achieve that involves rare perseverance, equipment that really works, and special skills.

First Foundation Licence Issued

Some 16 people qualified at the Foundation Training Course conducted by the Gold Coast Amateur Radio Society over the weekend of 16 and 17 September 2005, involving a group of WIA Assessors, led by Nominated Assessor, Ron Bertrand, VK2DQ. The first Foundation licences were issued the following Friday, 21 October 2005, after ACMA's Determination creating the licence came into effect on the previous Wednesday.

The very first licence issued was issued to Amanda Gray.

Amanda, a legal secretary, was encouraged to undertake the training course by her husband, Chris, VK4XWD. They have two children, aged 6 and 3, and so life is very busy!

Amanda says that she was not really convinced about the course before she started it, but she really did enjoy it and became genuinely interested as a result, so much so that she had been helping Chris erect an antenna.

She had asked for the callsign VK4FRST before she knew that her licence was, in fact, the first Foundation licence issued in Australia, because she thought she had to be a first something, perhaps the first mum to get a Foundation licence, and was a bit embarrassed when she was told that she really was the first.

At a special meeting of the Gold Coast club on Sunday 23 October 2005 to mark the issue of the new licence, WIA President Michael Owen, VK3KI, stressed the responsibility imposed on the WIA and the clubs to make sure that the new assessment system retained credibility, while hastening slowly to avoid errors but to meet the real demand for the new licences as soon as practical.

On behalf of the WIA and to mark her achievement, Michael presented Amanda with a copy of the just released ARRL handbook, and a WIA satchel.

Doug Hunter, VK4ADC, from Ozgear, Brisbane, presented Amanda with an Icom radio, on behalf of Ozgear and Icom. Amanda and Chris both became WIA members on the spot.

Queensland clubs meet with WIA President

Members of the Queensland Advisory Committee and representatives of some 13 radio clubs, including one CB club, met with WIA President, Michael Owen, VK3KI at a lunch function on 22 October 2005 in Brisbane.

The clubs came from as far north as Townsville and included clubs from Rockhampton, Dalby, the Sunshine Coast, the Brisbane area and the Gold Coast.

continued on page 48

Are you ready for action?

Bill Isdale VK4TWI

Part One

In the near future encoded transmissions will be permitted for such things as control of radio apparatus on satellites and for communications during emergency services operations and training.

The meaning of this is yet to be established and in today's world it is not realistic to expect that an agency of government will spell everything out in detail. These days it is the fashion that there be "more steering than rowing" and it is likely that some flexibility in carrying out a new policy will be left to those doing so.

It will be necessary to continue to provide communications facilities to augment those of the emergency services, probably at effectively no notice.

Those services are beginning to move into digital communications and no doubt experiencing their own learning curve as they realize that digital systems have shortcomings as well as advantages. One feature is that there is either a good signal or none at all with no middle ground. There will be areas of no coverage where conventional analogue systems may have provided a poor but useable signal.

Some digital systems can be received with equipment that may already be in the shack but a number of networks are now also encrypted to provide privacy to the users. This will also prevent monitoring and relaying of messages by volunteers in times of emergency.

Clearly, the users of these systems have closed them to the world in order to gain some security. In the event that there is a serious emergency, however, their natural inclination to be self-reliant may put them beyond easy access to improvised help from those with communications training and equipment.

This is a foreseeable difficulty. What can realistically be done to provide communications when compatibility has been deliberately precluded?

The rationale for implementing a closed communication network will rule out volunteers being permitted to have their own hardware equivalent to that used in the official network. It will just not be possible to fill in gaps in that system seamlessly even at a time when the need for security may be less pressing than the need for interoperability. That opportunity has been closed off. It will be necessary to do what is possible rather than lament what is not.

What can easily be provided is what is already available, a stand alone operation using the frequencies and modes available to us. That will certainly be useful but if security is required then the familiar modes may be unacceptable to the emergency services for passing some or all of their traffic. After all, where is their security if they fall back onto an open system in a crisis? It would make a nonsense of their system if, when there is a serious emergency, they pass the same traffic over open channels to places where their system will not reach.

The choice would be not to use the open system and to maintain security at the price of perhaps a partial blackout in areas not reached by the official network or to communicate using conventional modes. If the latter, then using that to its full potential means a loss of security. A compromise of using that open system in a way that does not break security will reduce the scope for effective communication.

This is not a particularly pretty picture but a decision along these lines will be likely to be required in an emergency.

If encoded transmissions are able to be provided in aid of the civil authorities then although not compatible with their systems, they are probably going to be of some use, especially when there is likely to be an increased perceived need for security, whether or not the need really still exists. During an emergency is not the best time to try to convince someone that they don't need security; it is probably best just to provide it.

If we have the option of using encoded transmissions then it can be offered. As to what "encoded" means, we can begin to consider the concept.

At present, there is not much guidance as to the content of the expression and there is even less in the way of generally accepted technical standards and equipment available in the amateur radio market in this category. It will not do much good if we try to use pieces of equipment that cannot talk to each other.

Voice communications devices using standardized digital modes that can fit a reasonable definition of being encoded are well developed and in common use. They are usually called mobile telephones. Events have shown that the mobile phone networks are relatively fragile and can be overloaded and ineffective when hordes of handset users are all trying to call at once, something that might be expected in an emergency. Those systems are not nearly as robust as the plain old telephone service.

We are not contributing anything if all we can offer is to use a mobile phone. It is a technology that we can't readily implement our own version of, as it is costly and of short range unless networked. We need a system as reliable as what we have now but with security added.

The optimum solution would be to be able to, for instance, add a hardware module at each end of a radio link to encode the outgoing signal and decode the received signal and to do so irrespective of whether there is a repeater in the link. It would be desirable to do this while using existing modes and bandwidths for the transmitted signal. This would help to achieve the goal of continuing to use existing transceivers.

A modem in line from the microphone could be used to digitize and perhaps also encrypt the signal and to similarly demodulate and if appropriate decrypt the received signal, which could be carried as, for instance, a conventional narrow band frequency modulation radio frequency transmission.

If this modem complies with an accepted standard then reliable and secure communication can be provided. The cost to the operator is the cost of the modem, The experience with internet modems suggests that this would rapidly decline with mass production, and this

can take place once there is a standard and a demand for the product.

Realistically though, we would be waiting a long time for this to come about. Perhaps we can solve the problem for ourselves.

Just for a moment, let us think about what we would have to come up with to meet the need for security.

Security can be defined as a reduced likelihood of some unwanted situation. It is a feeling of comfort, hopefully at least reasonably grounded in reality. It is a relative concept and for present purposes could be taken to have been achieved when the communication could not be made intelligible by a likely eavesdropper within a reasonable time; as after a while the information would not be topical anymore. Like a safe at a bank, it does not need to be able to keep a thief out for longer than such time as he can expect to have available to crack it.

For present purposes, no greater security than that achieved by the official network is necessary. In order to see how this can be arrived at it is necessary to briefly consider the likely attributes of an official system.

Our hypothetical system will be digital and use encryption which the manufacturer describes as "128 bit". The analogue voice input from the microphone is converted into a digital format, which can be thought of as a series of 1 and 0, or "on" and "off" instructions. When transmitted the digital signal will be heard as the static it resembles. Of itself, the digital mode excludes the casual listener. Digital receivers can be bought, so the encryption provides the main element of security.

It is common to hear encryption being described as "128 bit" so it is worth while considering what this means. It is usually thought of as an assertion that the encryption is "strong" or "unbreakable", often with an explanation that it would take all the computing power in the world a few billion years to "break" it.

That sort of fuzzy generality, no doubt meant to be satisfying, ought not to be an impediment to thinking about what is actually involved.

Any manufacturer who is experienced in encryption will make use of an encryption method, a mathematical algorithm, that has been demonstrated to be well designed to withstand attacks by the people who specialize in the branch of mathematics involved, cryptography. Someone who offers their own "proprietary" encryption is asking their customer to accept that it is strong without knowing anything about it. The customer could of course do that if they wanted to, but a published algorithm, which has withstood years of attacks by the world's experts, is more likely to be chosen by an emergency service. Let's assume that this has been done.

This is the equivalent of choosing a very reputable brand of lock for your front door. The lock mechanism is open to scrutiny and a good locksmith assures you that it has been tried and tested over the years. What makes it secure, as far as you are concerned, is the key. It is just the same for cryptography.

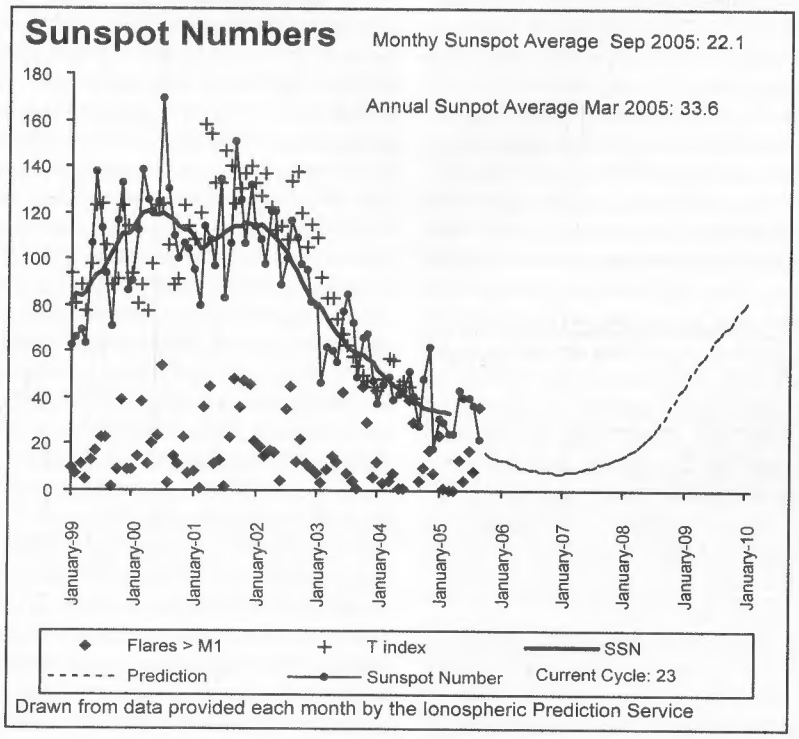
Our locksmith will set the lock cylinder to accept a key cut to push the pins inside the cylinder up against spring pressure to where it is released and can be turned so that the lock will open. There will be probably 5 pins and each one must be pushed up just the right amount. The locksmith sets the cylinder to require each pin to be pushed up to a certain point and the key is cut with ridges of the correct lengths to push the pins up to the right positions. We know that multiple locks can be set to accept the same key and that the lock cylinder can be reset to require a new key, although the locksmith will have to attend and remove the cylinder from the lock to set it for a different key.

The encryption algorithm is the lock; we choose one that is known to be good, and the encryption key which tells the algorithm what variables to apply in the encryption and decryption is the key to the lock. The same word is used in both situations and it describes the item perfectly.

The key used for encryption and decryption will be the same. This is known as a symmetric key, the same one is used for both purposes. This system is most likely to be used, as there will be multiple transceivers which need to be able to encrypt and decrypt messages. They must all have the same key. It can be programmed into them as software. If someone acquires an identical transceiver they cannot get any access to the information flow without the key.

The key will be a digital one, a string that will look something like this 110100111010001 and will simply be 128 characters, bits, long. The algorithm uses the 128 bit key to instruct it how to mix the digitized signal, also a stream of these 1 and 0, on and off, instructions, so that what is transmitted is not intelligible without the key.

(Part two of this article will appear in *Amateur Radio* December issue)



A Morse frequency meter

Phil Rice VK3BHR
http://ironbark.bendigo.latrobe.edu.au/~rice

No, it doesn't measure your Morse! Instead, it is a frequency meter that announces the measured frequency in Morse code. It is another version of the Updated Digital Frequency Display published recently (*Amateur Radio* Sept 2005). Interested readers are referred to that article for a bit more detail.

How it works

As with the previous design, it uses a PIC microcomputer to do all the work. The LCD display of the previous version is replaced by a "loudspeaker" connected to pin 18 via a resistor of 470 ohm or more.

Three jumpers connected to pins 6, 7 and 8 allow the selection of 8 different Morse speeds, from around 8 wpm to 20+ wpm. The jumper on pin 8 has the greatest effect, the one on pin 6 has the least.

The PIC also has a 9600 baud serial ASCII output from pin 17. Pin 9 can be grounded to turn the Morse off, leaving only the serial ASCII output active.

A jumper on pin 2 sets the count resolution, either 3 or 5 digits after the decimal point (1 kHz or 10 Hz resolution)

See the previous article for details of the other jumpers on pins 10, 11, 12 and 13.

The extra transistors on the circuit diagram implement a push button "start" function. At the completion of one measurement, the PIC turns its own power off. This is inherently troublesome as the PIC may change its little mind. The power control circuit prevents this. The whole lot can be deleted and replaced by a single pole switch if you want.

Getting the software

The source code for this version is available on the web at http://ironbark.bendigo.latrobe.edu.au/~rice or I can mail a copy on disc.

If you don't want to go to the trouble of building a programmer and downloading the software (you will also need the Microchip PIC assembler), then I could visit my local Jaycar store and buy a chip. A cheque for $15 would cover my costs (the price of the chip plus postage).

The last word

That's it! Three frequency meters from the one author may be one too many. I couldn't resist designing one for the CW/QRP/OT brigade. If you want a simple cheap frequency meter then you have to embrace modern technology. You could always make believe the PIC is not a computer, just a fancy frequency meter chip!

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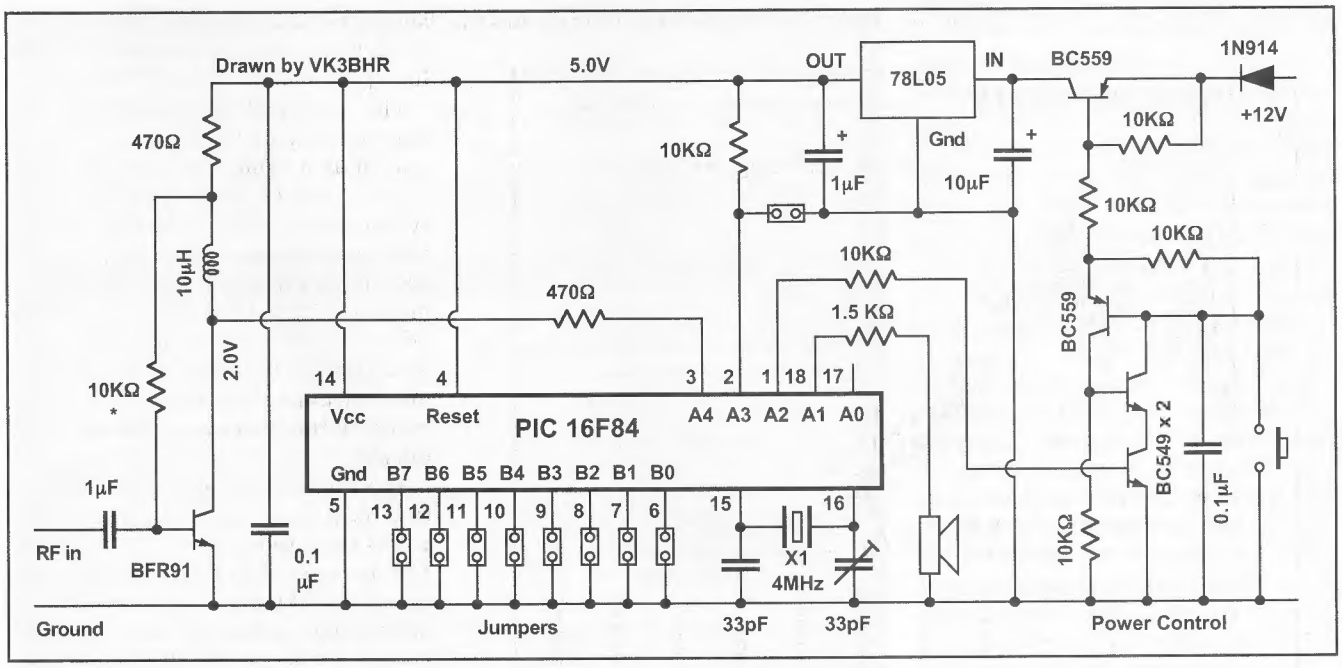

Fig 1 – Circuit of the Morse frequency meter.

Library amateur radio displays

Graeme Wilson VK6BSL

About October 2003 I spied in my workshop a couple of panels of MDF board about 1300 mm wide and 600 mm high, sitting there doing nothing. The light bulb in my head switched on and said these are just the right size for a display on Amateur Radio and Electronics to be exhibited in all of the Council libraries in metropolitan Perth for approximately two weeks at a time (about 40 libraries) .

I made a couple of aluminium wire hooks to fit through holes in the upper board and hang over the top of the approximately 1800 mm by 1800 mm display boards that most libraries use. It was preferable to use cloth covered boards so that all the QSL cards and other show-cards can be fixed by using sticky-back Velcro tape. I then fashioned two hooks to hang the bottom board from the top board (these boards easily fit inside a car).

To make the display more interesting I mounted four simple projects, a Foxhole crystal set (built by the Americans during WW2 and using a safety razor blade for the diode), a one watt crystal controlled transmitter built into a "Milo" tin, which has worked the eastern states, a working Morse Code oscillator complete with key, and a crystal set featuring an "S" meter which shows nearly full scale on our local ABC AM station.

In front of the display we put a table with some of the library's relevant books on it. Try to site the display in a prominent place near the reception desk if possible. We also make use of the Library's internet connection to produce about 10 copies of the International Space Station's sightings for Perth over the next few days. This is updated by the library staff.

The show-cards feature many of the different ways you can enjoy amateur radio and electronics, and the plentiful supply of junked parts from TVs, computers, etc, as well as the cheapness

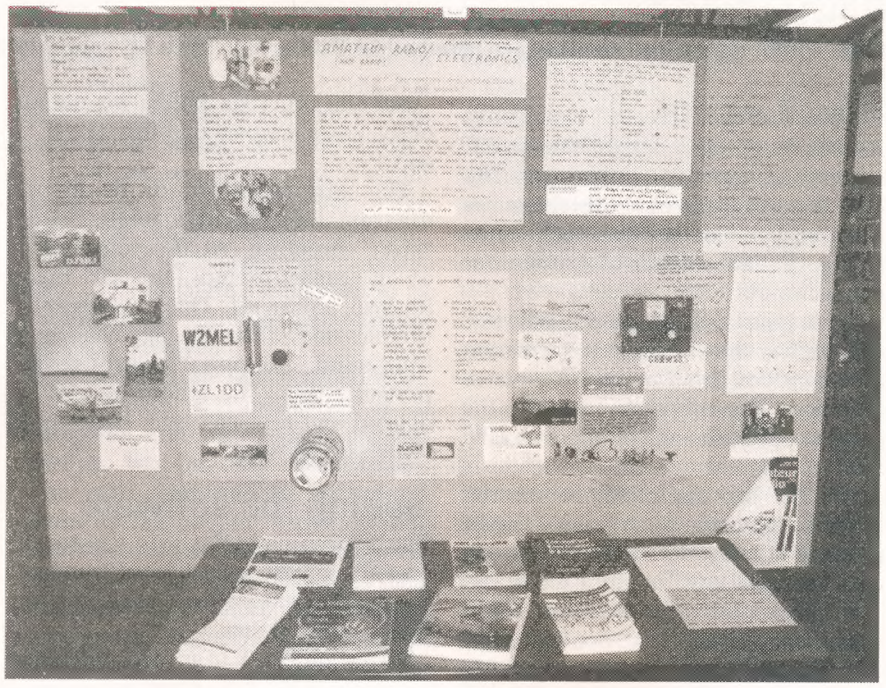

Photo 1 – The complete library display.

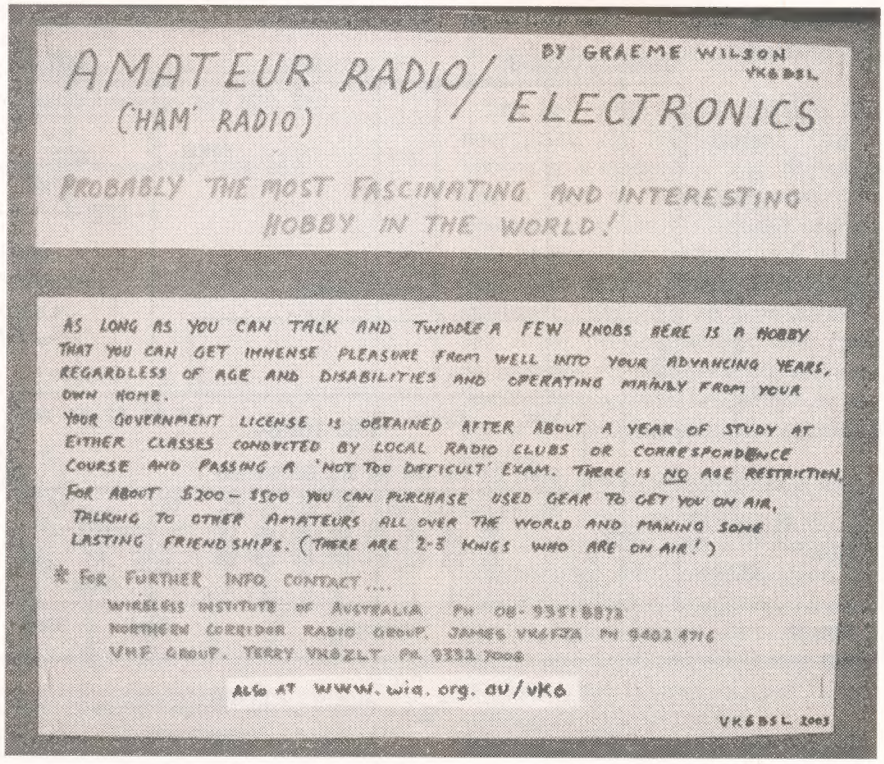

Photo 2 – The main text of the display.

and safety involved in most of the wide range of projects available to build or operate.

We have had the utmost co-operation from the display staff at all the libraries we have approached and several want the display back in a few months time. The reaction from their members has been gratifying and makes the project worthwhile.

After doing most of the north area myself I now have a very keen Kathie VK6KHR, a relatively new ham, doing the southern part and enjoying talking ham radio to future operators. Our local broadcast announces the whereabouts of the display each week.

I would be most happy to assist anyone who wants to duplicate our efforts to publicise the hobby in their own city or locality. Incidentally, we are looking for other amateurs to set it up in their local libraries south and north of Perth to spread the word.

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Photo 3 – Graeme VK6BSL with the Foxhole crystal set he made for his library display (photo from the Wanneroo Times, 14th October 2003).

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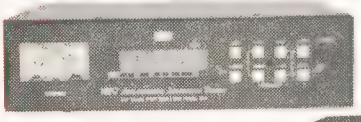
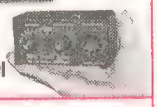


and the amazing MFJ 902 Travel Tuner



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Restoring an 18AVT multi-band vertical

Peter Stuart VK2BEU

In the February 2001 issue of Amateur Radio, Barry VK2AAB wrote about repairing the 80 m coil of an 18AVT antenna. This was helpful to me when I attempted the complete restoration of a 30 year old 18AVT which had lain on the ground in long grass for some years.

First inspection of the antenna revealed that a lot of work was in front of me. I found extensive corrosion of all screws and nuts, all the coils were open circuit, and there was surface pitting on all aluminium surfaces. The 80 m radials were missing altogether.

The first job was to give the existing aluminium tube sections a good cleanup using soaped Steelwool pads which brought the surface back to a bright finish. Some tubes had corrosion holes right through the tube wall. I rang around and found that Smart Aluminium at Wetherill Park in Sydney had a small stock of 1-1/8" OD tube which was just the right size. It was a simple matter to cut the tube to the right lengths and put a short longitudinal saw cut in each end (for later compression) using a bench-mounted circular saw.

The lower resonators for 10, 15 and 20 m are identical in construction, so once I worked out how to get one apart, the others came apart easily and all showed the same corrosion problem. Each coil has a tapered spun-aluminium weather cover which is fastened at the narrow end by three self-tapping screws. Carefully removing these screws (because they were rusted) I was able to slide each cover off one end of its coil by judicious tapping with a wooden mallet. Two black polyethylene ring spacers also came out. These sit inside the large end of the cover to maintain concentricity.

Inside is a coil of aluminium wire wound on a tubular nylon former which has a coarse pitch helical groove machined in it. In that way, the coils do not touch each other, so no form of insulation on the wire is necessary. The ends of the coil are anchored under the heads of self-tapping screws. These screws penetrate radially through the nylon former and into thick-walled aluminium tubes which protrude from the ends of the coils and slide into sections of the mast above and below. The zinc-plated self-tapping screws had corroded, losing contact with the wire and possibly with the thick-walled aluminium tube. I cleaned up all components in these assemblies, but most particularly the ends of the wire, and used stainless steel self-tappers to replace the rusty screws. When I had ascertained that there was a good circuit though the coil, I replaced the aluminium weather covers.

After reassembling each resonator, I made two plastic weather-proofing rings to go onto the open ends of two of the coils which are positioned with their open ends upwards on the antenna (why does Hy-Gain do this – they are a perfect rain catcher?). The rings were missing from the antenna but I was able to machine two new rings from ABS plastic, using the assembly sketches in the manual as a guide for the right shape.

There is an impedance matching coil in the bottom of the antenna, just above the SO-239 connector. I drilled out the pop rivets which gave me access to the coil. It was in good condition as it is surrounded by wax. I replaced the SO-239 socket, cleaned up all the connections, and reassembled the lot using 3 mm stainless steel screws and nuts, although everything was now squeezed inside because of the presence of the nuts on the inside. Aluminium pop rivets would have been better, but I preferred to use screws in case I had to dismantle it again.

That left me to fix the 80 m resonator, and here I had a bit of luck. Unlike Barry, I was able to tap off the metal end caps and so didn't have to hacksaw through the ends of the coil to get it apart. The outer fibreglass sheath slid off easily, exposing a close-wound coil made from aluminium wire, enamel-coated to insulate the turns. The ends of the coil pass through holes in the former and are anchored by steel screws into the inside faces of bronze end plugs. The bronze end plugs are tapped 3/8"-24 through their middle. The lower plug receives a zinc-plated steel stud, the other end of which screws into an aluminium threaded bush in the adjoining lower mast section. I thought this was a poor mismatch of metals which could lead (and had led) to corrosion, so I made two new end plugs from stainless steel and obtained a stainless steel stud. I also replaced the threaded aluminium bush in the adjoining section, so that I had only stainless steel-to-aluminium interfaces throughout my antenna. I have found that stainless steel and aluminium go well together in minimising corrosion.

I decided to anchor the coil ends by drilling and tapping M4 holes radially into the end plugs, through the wall of the coil former. The hole through the coil former was drilled out larger than the diameter of the screw head, so the screw sits low in it, and I used pan-head screws. This arrangement kept the screw heads low enough to allow the outer sleeve to slide on.

Finally I had to find out the length of the 80 m radials which had gone missing. A request on the VK2 Sunday broadcast brought four replies that the length from tip to centre of eye is 12". I used 1/8" aluminium wire, although I think stainless steel rod would be better.

To re-assemble the antenna I used stainless steel fasteners throughout. Originally, the clamps which tighten each tube section over the next-smaller tube used zinc-plated steel screws, which had rusted; so I made new square nuts out of 6 mm stainless steel plate and used M6 screws through them. I thought I had done a better job than Hy-Gain by choosing to use stainless steel fasteners throughout, but I have since noticed on their website that they have re-introduced the antenna (now known as the 18AVQII) and one of the new features is all stainless steel fasteners!

Experiments in aircraft enhanced propagation

Barry Miller VK3BJM

In November 2003, I wrote an article about my trip to Waukaringa SA, for the purpose of investigating Aircraft Enhanced Propagation (AEP) on 144 MHz and 432 MHz back to Melbourne. In conjunction with this, I have spent the last three years investigating AEP in far west NSW. This investigation stemmed from a trip in April 2001, to a place called Mt Manara.

In the beginning

Mt Manara is in the Manara Hills, 60 km northwest along the Cobb Highway from Ivanhoe. The purpose of the trip had been to activate the Maidenhead Locator (or "grid square") QF17xm on 2 m and 70 cm, and I had expected to exploit tropospheric ducting or meteor scatter to do this. This trip fell under the definition of "flying by the seat of your pants". I had no idea where exactly I'd be operating from, or how the land would lie – I just knew there'd be a range of hills out there. I was lucky – I found the landowner whose property the hills were in, and he gave me permission to camp at the survey marker. The surrounding plain had an average height above sea level of 90 m – the hills rose steeply from the plain, and the survey marker was at 175 m ASL. It was a fabulous view!

Unfortunately, conditions to VK3 were not so fabulous, and only allowed a single CW contact, on 2 m, into Melbourne. But on Sunday 22nd of April, I was persuaded (via HF liaison) to turn the Yagi towards Sydney. I was immediately told that my CW keyer was being heard by Gordon VK2ZAB, and to "go to voice". Contact was made on 2 m and 70 cm, both with amazingly good reports (up to 56 and 54 respectively). The distance to Gordon was 680 km. Later that morning I also completed on 2 m with Alan, VK2DXE.

Alan was instrumental in both setting up the contacts (he was passing messages on HF) and highlighting aircraft enhancement as being the mode of propagation. At the time he lived near Sydney Airport, and was able to tell me when an aircraft departed – we then timed starting our calls about 25 minutes later.

Finding AEP supporting communication from the far side of NSW was a big and very pleasant surprise – it turned the trip from a near disaster to a major success.

Research time

Back home, and with the assistance of several VKs, I started researching what was supporting these contacts. From Airservices Australia I obtained "En Route Charts" (ERCs). These are charts that show details for all flight paths over Australia. I also bought World Aeronautical Charts – 1:1,000,000 scale topographic maps of Australia.

I assembled eight of these maps into a single map covering the southeast corner

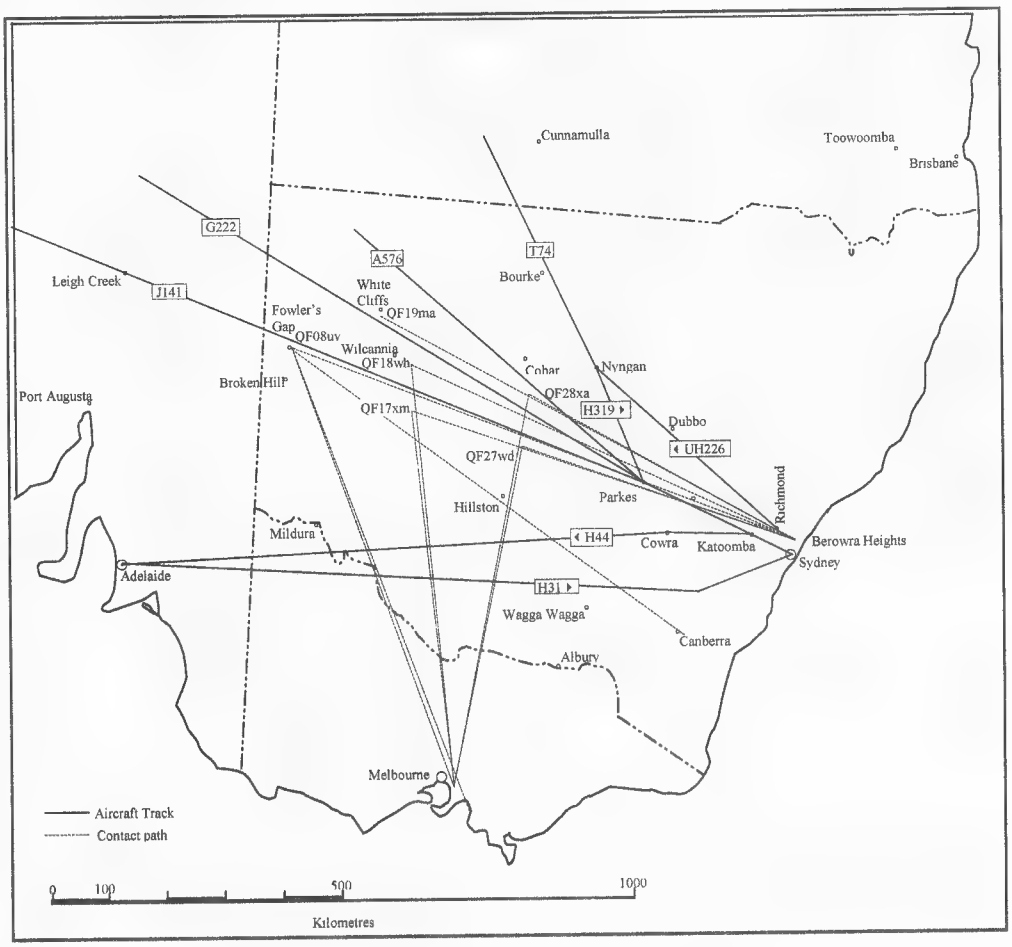


Fig 1 – Map of aircraft tracks and AEP contact paths

of Australia (south of the NSW/QLD border, and east of a line running north through Coober Pedy) and marked the high-level flight paths onto this map. When I marked on it the beam heading of the contact with VK2ZAB, I could see where it intersected the flight paths.

The important paths were those that carried international flights between Sydney and SE Asia – important because they are big aircraft (like Boeing 747-400s) and they are at high altitudes (around 41,000 feet). These paths head out over Katoomba to Parkes, where they diverge and form four different paths.

The first is called J141, and it leaves Parkes on a heading of 274°, continuing to the waypoint at Leigh Creek SA. For information's sake, at Leigh Creek J141 swings to the south west to continue on to Perth via the Kalgoorlie waypoint. This path carries domestic air traffic – but at high altitude.

The second is called G222, and is a two-way international path that leaves Parkes on a heading of 282°, travelling almost in a straight line over the Ayers Rock waypoint onto Broome, where it swings onto a heading of 296° en route for Jakarta. The inbound traffic is kept separate from the outbound traffic using specific altitudes for each; the outbound (from Sydney) traffic is higher than the inbound traffic.

Next is the path A576, which heads from Parkes at 291° to Alice Springs, then over Derby to Bali. On this two-way track, the inbound (to Sydney) traffic is higher than the outbound traffic.

Lastly there is the T74 track, known as such between Nyngan and Tindal Airbase in the Northern Territory. It splits into two separate tracks at Nyngan – one (H319) to Parkes and then on to other points; the Tindal-bound path UH226 is direct from Richmond Airbase to Nyngan. Obviously this is for military traffic, so flight schedules are not likely to be available! However, the traffic is very high – between Richmond and Nyngan the minimum safe altitude is 55,000 feet.

For working back into VK3, the domestic flight paths between Adelaide and Sydney were suitably located near the radio path midpoint, albeit nearly at right angles – which meant propagation would be brief.

Now that I had the propagation-supporting flight paths marked on the map, I could then select other operating spots ensuring that the beam headings intersected these flight paths in a favourable way – around the midpoint between my spot and the station to be contacted.

Trip number 2 – November 2002

In mid-November 2002, I returned to the area for more trials. I had more time available and I travelled in a large loop – up the Cobb Highway to Wilcannia, east along the Barrier Highway to Cobar, then south down the Kidman Way. I stopped overnight at four locations: (1) Mt Manara, (2) a spot in the MacCullochs Range (50 km east of Wilcannia) – QF18wh, (3) near Killala Station (50 km south of Cobar) – QF28xa, and finally (4) Mount Hope – QF27wd.

Sixteen contacts were made into Sydney, and with numerous stations, on both 2 m and 70 cm. While near Wilcannia and Cobar, I was close enough to the aircraft flight paths to see the aircraft passing – in fact they would wake me at 6 am each morning. The aircraft were seen both coming from and heading towards Sydney. From Killala Station, it was just possible to watch the aircraft change course slightly as they reached the waypoint at Parkes.

Nineteen contacts from these four locations were also made back to Melbourne and Geelong, from AEP provided by the Sydney-Adelaide flight paths.

The Wilcannia – Sydney contacts were achieved at a distance of 712 km, while those back to Melbourne were at a distance of 697 km.

By now I had satisfied to myself that contacts from the west of NSW could be made reliably and regularly. Now I wanted to see how much further west contact could be made from. Next month I'll tell you how the subsequent two DXpeditions went in exploring this.

Silent key

Julie Kentwell VK2XBR

It is with regret that I announce the passing of Julie Kentwell VK2XBR.

Julie was known to many people and radio inspectors as "The Batman" during the early years of CB in the 1970's. Julie served a short period of time in Long Bay Jail for, as he put it, "Using the King's Airwaves without the King's permission". An achievement he was proud of.

At times through his life he stubbornly refused to embrace new things, he often later excelled at them. Julie obtained his ham ticket in 1977 and married his wife Jenny in 1980 who later under Julie's guidance become VK2PIG. Jenny passed away in 2001

Julie's talent for electronics and mathematics found him employment in the Television servicing industry. Television made up a big part of Julie's life, visitors to his place would be confronted by televisions at every station, including the toilet.

As a ham, his talents were focused on Amateur Television and he built many of the parts of the first Amateur Television Repeater with it's output on ch35 UHF in the 50cm band. (It is still in operation today on 444MHz in the Sydney area). This led onto the formation of the Sydney Amateur Television Group in 1985. (SATVG).

He also served on the WIA council for many years and the Sunday broadcasts. Some of which had listeners in stiches of laughter and others less amused. His talents were spread widely from Mathematics to Orthography, Music to Morse, Cicadas to Chemistry, Politics to Poetry.

Julie was a person who affronted many people. But he often made more friends than not.

I once heard him say, "Life isn't about having good cards, it's about playing a poor hand well".

Submitted by TRASH - VK2XSO

A Tetrode Tester

Drew Diamond VK3XU
Photos: Andrew Diamond

For various technical and economic reasons, tetrodes remain in use in a significant number of amateur transceivers. Indeed, many recently built homemade transmitters and audio amplifiers use power tetrodes or pentodes in their output stage. It is still possible to buy new EL34, KT66 and 6L6 tubes from at least one well-known electronics retailer, and several USA mail-order businesses can supply just about any power tube that the radio amateur or audio enthusiast may require.

With our well-earned reputation for frugality, the typical amateur becomes adept at finding, negotiating, bartering (and, as a last resort, buying) used and new tubes from all kinds of sources. To test a tube of unknown goodness, it is usually necessary to open up the equipment, plug in the tube and measure the output signal obtained, and thus get some idea as to the serviceability of the tube. It is quite usual for tubes to be configured either as parallel or push-pull pairs, and so some simple means of testing individual tubes, and matching pairs, is highly desirable.

Offered here is an outline, using obtainable components, for a basic, effective, and safe, quasi transconductance/mutual conductance tester for tetrodes and power pentodes of the type typically used in audio power amplifiers and older style amateur transceivers.

Circuit

To test a tube and obtain an estimation of its usefulness, it is necessary to power the heater, provide a positive dc supply for the screen grid (g2) and plate (p), and an adjustable negative supply (with respect to cathode) for the control grid (g1).

As there are no catalogued power transformers easily capable of supplying the few hundred volts needed for the plate and screen, the simple trick of back-to-back connected identical low-voltage transformers is used. See circuit Figure 1. Selectable voltage for 6 or 12 V heaters is obtained from appropriate taps on transformer T1.

The 15 Vac winding of T1 also powers a voltage doubler circuit which supplies an adjustable negative potential for the control grid (g1). A dual 10 k gang pot is parallel connected as shown to improve reliability of this part, and assure a smoothly adjustable grid supply.

Normally, the plate and screen are powered from a supply that is positive with respect to chassis. However, for tube types whose plate connects through a top-cap (tc), a real shock hazard exists where the operator may accidentally touch the cap whilst some other part of the body is in contact with chassis or ground. A shrewd expedient is to simply invert the test circuit so that the positive side of the plate supply is at chassis ground potential, and thus the cathode carries the high potential.

In order to estimate a tube's transconductance/mutual conductance, plate and screen voltage should customarily be held constant for the measurement (References 1, 2 and 3), but a series resistance of about 2.4 k is included here to limit plate and screen dissipation. Plate plus screen current is monitored with a 0 ~ 100 mA meter, and grid volts are measured with a 0 ~ 50 Vdc meter.

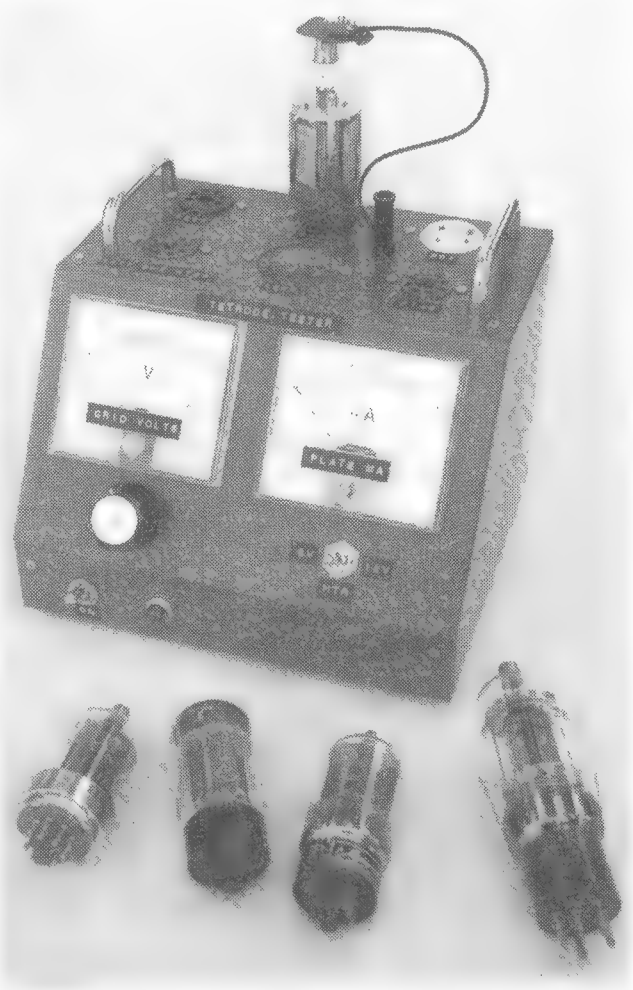


Photo 1 - Tetrode Tester.

My shack has equipment which uses 6146, 6L6, 6JS6, 6DQ6, 807 and 1625 type tubes, and so six individual sockets have been wired accordingly. During the experimental phase it was found that, due probably to parasitic wiring capacitance and inductance, some tube types would burst into oscillation during testing. A simple and effective cure is to fit parasitic stopper resistors of 100 ohms at the plate and screen pins, and a 4.7 k resistor right at the grid pin for each tube socket.

Construction

The homemade 1.3 mm sheet aluminium case, shown in Photo 1, measures 155 x 185 x 220 mm HDW. My 60-degree sloping front panel allows easier viewing

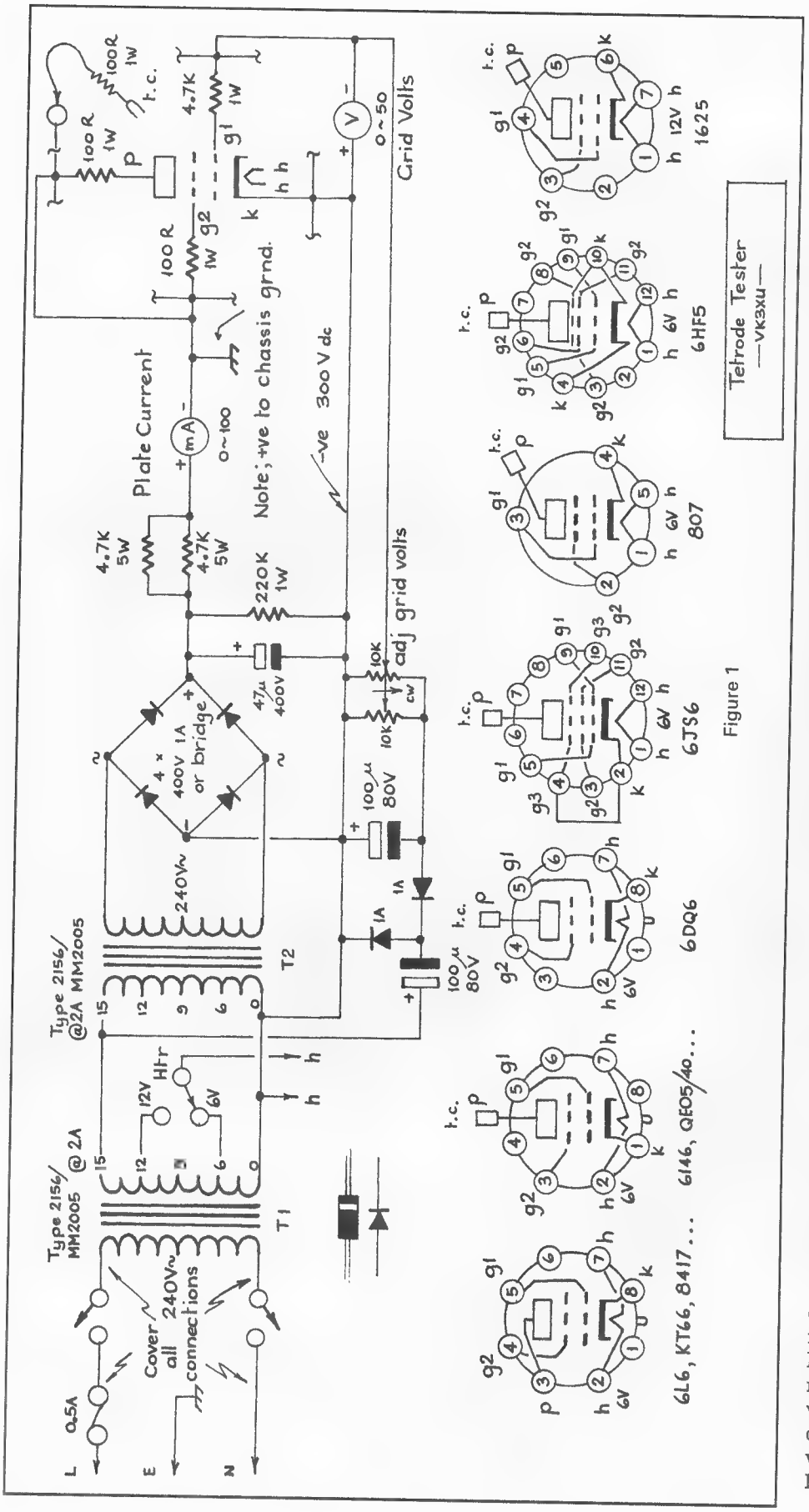


Figure 1

of the meters. Naturally, any metal box of similar size should serve.

A suggested layout is illustrated in Photo 2. Two 16-lug tag boards accommodate the rectifier diodes, filter capacitors, 220 ohm 1 W bleeder and 4.7 k 5 W wire resistors. Ordinary hook-up wire is satisfactory for the grid supply and screen/plate supply. Wiring for the heater supply and 6 V/ 12 V switch should be made with 24 x 0.2 mm hook-up wire. Note that all connections on the mains side of T1 must be suitably covered with heat-shrink tube or spaghetti to prevent accidental contact.

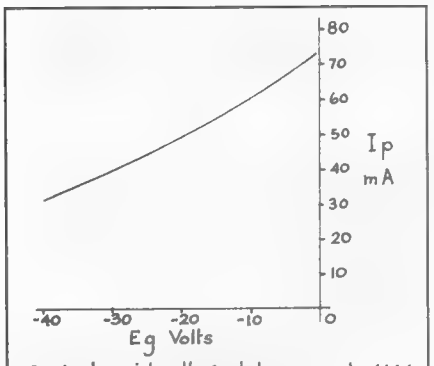
Install a socket for each tube type required, wired according to the pin-outs shown in Figure 1. The schematic attempts to show that the relevant elements (g1, g2, etc) are paralleled for each socket with the exception of top-cap type tubes, for which a single banana socket is provided, into which is plugged a "wandering" lead fitted with a plate connector and 100 ohm suppressor resistor (visible in Photo 1).

The screen pin of each socket may simply be connected to a chassis lug adjacent the socket via a 100 ohm resistor, as also may the 6L6 (etc) plate resistor. The grids (g1) may be fed with a single-strand bus wire, to which is soldered a 4.7 k grid stopper for each socket. Note that power pentodes (like the 6JS6) must have their suppressor grid (g3) connected to cathode (k) where appropriate.

Operation

Upon first power-up, carefully measure the main HT supply with a multimeter and confirm that you have about -300 Vdc with respect to chassis. Rotate the grid volts potentiometer and observe that it can be adjusted from 0 to about 40 Vdc.

Set the heater switch to the correct voltage, and then plug in a tube to be tested. As the heater warms up, the plate current meter should deflect. Vary the grid voltage pot and observe that plate current decreases smoothly as grid voltage is increased. A typical Eg: Ip curve for a 6146 tube is shown



Typical grid volts : plate current; 6146.

Fig 2

in Figure 2.

This functional test checks a number of things, particularly if a known good tube is available for comparison. We can determine that the:-

- heater is working,
- cathode has sufficient emission (if a tube has low emission, it is not possible to obtain a high Ip at zero grid volts),
- plate current varies in direct response to changes in grid voltage, and that therefore
- the tube probably does not have significant faults, such as leakage between g1 and other elements.
- When allowed to "soak" for some minutes, plate current should remain steady when grid voltage is held constant. A gentle tap on the side of the envelope will show up any "intermittents". Furthermore, a slow but notable variation in plate current (when warm) indicates that the tube may be "gassy".

Viewed in the dark, a faint blue fluorescence may be observed on the inside of the glass envelope. This indicates that the tube is probably quite new, and "hard". Conversely, a blue-pinkish glow in the space between the elements indicates a "soft" or "gassy" tube.

There is no test for heater-cathode leakage. However, as most power tubes are operated with their cathode(s) at or near ground potential, the existence of moderate leakage should not seriously affect operation.

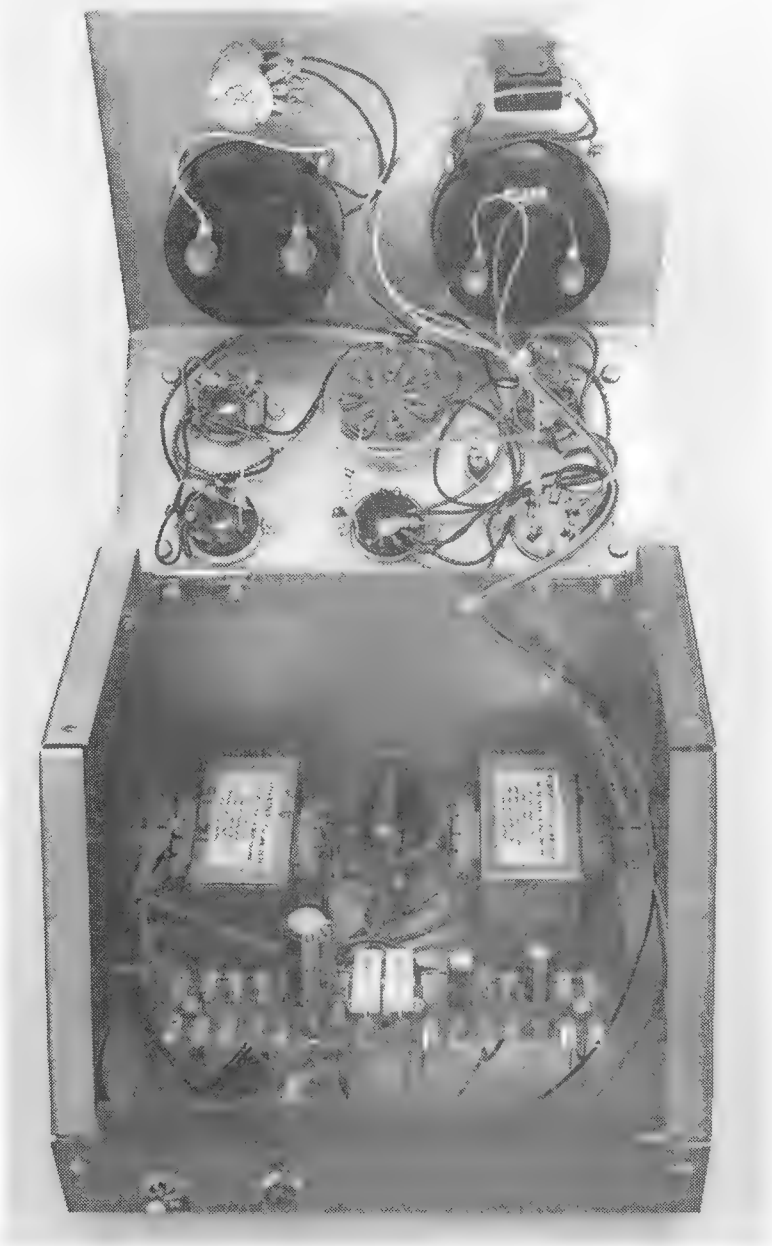


Photo 2 - Internal view, suggested layout.

Parts

It happens that most of the conventional components, including transformers, diodes, resistors, capacitors, tag boards, and switches, etc were purchased from my local Jaycar, but similar suitable parts are also collectively available from the other well-known electronics retailers.

Ordinary 8-pin octal tube sockets are obtainable from one or two local suppliers. However, the 12-pin Compactron socket for the 6JS6, and 7-pin for the 1625, may be locally problematic. These, and many other types, are available from at least one well-known US mail-order business, Antique Electronic Supply - www.tubesandmore.com

References and Further Reading

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2. The ARRL Handbook for Radio Amateurs; Chapter 13 in any recent edition.
3. Radio(tron) Designer's Handbook; F. Langford-Smith, AWA/RCA , 4th edition, p15.

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Load the software on your Windows based PC and connect to a USB 1.1 compatible port. Software currently provided with VNA was developed by TAPR (Tucson Amateur Packet Radio Corporation). An open-source free version and other info is available on the TAPR web site. A Linux version is under development. All displays and plots are derived from these four measurements:•S21 Magnitude: gain or loss of two-port network from input to output. •S21 Phase: the transfer phase of two-port network from input to output.•S11 Magnitude: return loss of one-port or two-port network referenced to input of the network.•S11 Phase: the phase angle of return loss of one-port or two-port network referenced to input of network.

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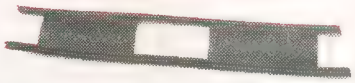

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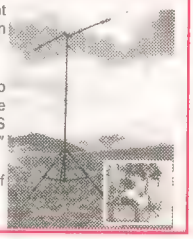

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DATV down under (Part 1)

Richard L Carden VK4XRL

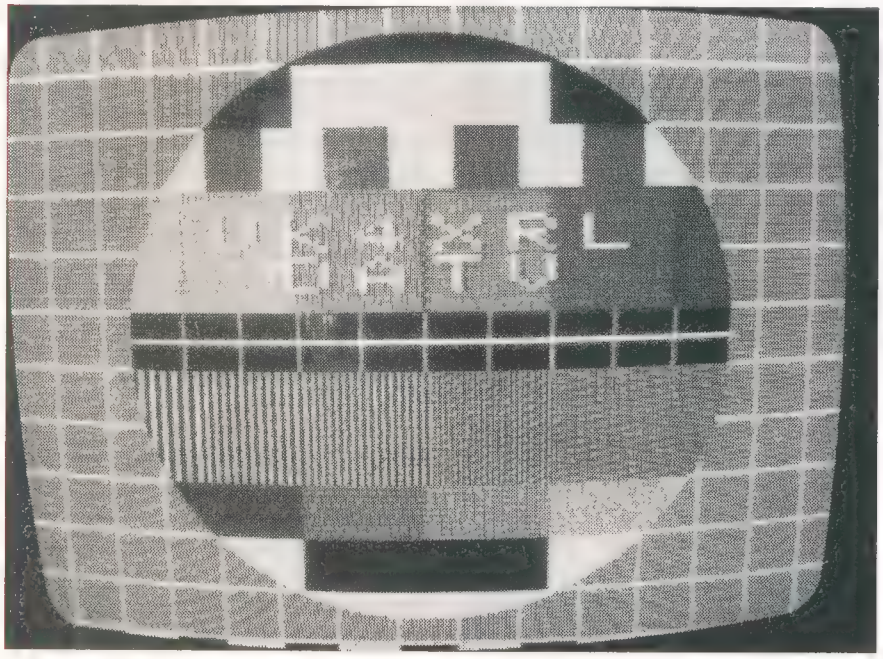
This article was originally published in CQTV 202 (May 2003)

December 3rd 2002 saw the first DATV transmissions from VK4XRL, the first in Brisbane and probably the first in Australia. Was it worth it and what were the results? Please read on.

Over the past couple of issues of CQTV we have seen many articles on DATV, some using DVB-T (mostly ex-commercial equipment) while others have used DVB-S. DVB-T uses the CODFM modulation system and, from an amateur point of view, the costs associated with such an undertaking would be prohibitive at this stage. The road taken after many hours of discussions was that of DVB-S. Our evaluation was, at the time, based on costs associated with CODFM and the uncertain future of the 70 cm band, at least here in Australia. Our belief was that, unless you were going to use 70 cm, then the slight shortcomings of DVB-S could be tolerated on the higher bands where most of the time it was line of sight. Also, DVB-S units were available, so tests could be carried out to ascertain if this was the way to go.

What system?

Three systems using DVB-S have been developed, one by the Dutch and two in Germany. The first system to be developed was that from the Bergische University by Prof Dr Ing Uwe E Kraus DJ8DW and his team. This system produced an output in the 70 cm band. The second system available was that from SR-Systems. The output from this system allowed dual operation in the 23 cm and 13 cm Band. Also, separate 23 cm and 13 cm units were available. The Dutch system was not available at the time we made a decision; however, their web site is worth a look at as it has lots of valuable information on the DVB-S system. From the above we decided to go for the system from SR-Systems. With thanks to Stefan we managed to arrange



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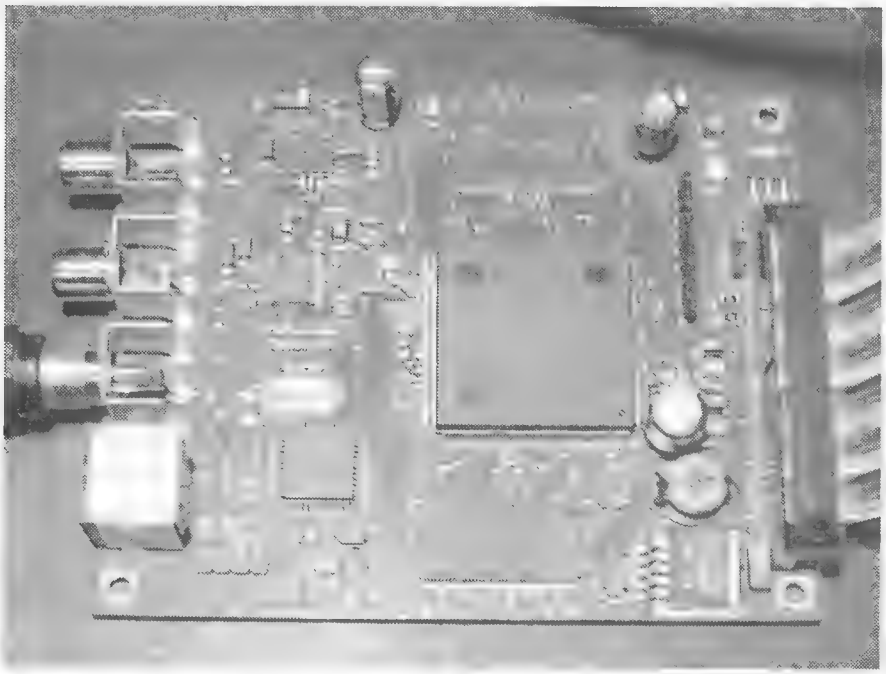


DATV Encoder

for a set of boards to be purchased, which arrived in early December 2002.

DVB-S System

What did we receive for our outlay? Thanks to SR-Systems we were able to trace the package right throughout its travel. The box duly arrived and two boards were unwrapped (the third board, the modulator, was already mounted on the Baseband Board). No other information was included with the boards. The system as received was configured for 1291 MHz, FEC ¾ and Symbol rate of 6000.

The first test was just in the shack to make sure things worked and also the frequency was not one of our ATV allotted frequencies. The unit was duly connected to the spectrum analyser with power and video connected. The satellite receiver used for the initial tests was a Hyundai HSS-100C and the required parameters were entered as required. At switch-on the satellite receiver came to light and there was a received digital picture.

The unit came with a pre-loaded test picture and this was also received. I next contacted Stefan and, via return e-mail, a new file was made available with the required changes. Also surfing of the net at this stage brought to light some extra information on the units supplied by SR-Systems.

Arthur Lambriex had a very nice lot of information on setting up the software; also Rob Krijsman had an article regarding his first experiments. Both these articles were in English and I am indebted to these gentlemen as well as Stefan for the help I received. Upon loading the software I found I had a corrupt cygwin1.dll file. Stefan re-sent this file and all was OK. Next problem was to replace the testpic with one of my own. The program TMPGE was downloaded from the Web and, following the information from Arthur, a new testpic was up-loaded successfully. Before any tests could begin, a rack system was built to house the system to save any wrongly placed items causing a major problem.

Test Results

Tests from the modulator output produced an output of +6 dBm with shoulders sitting at –40 dBc at 1250 MHz. Bandwidth was at 8 MHz, which is right for the parameters used. Next, a M67715 power module was used for some extra output. A pad of around 8 dB to 9 dB was used at the input to keep the shoulders at least around –30 dBc. This produced an output of around 24 dBm. A second unit was built and the level was around 26 dBm. Information on the net indicated that varying results would be obtained using these devices. From this humble beginning we transmitted to VK4KI about two to three km away. Perfect pictures were received using a Nokia 5400 series satellite receiver. We were also able to test the Teletext system using this receiver. As yet we haven't tackled updating the teletext software, as the Nokia is the only receiver that has teletext. The Humax also gave great results, however both receivers switched the testpic on and off. According to the

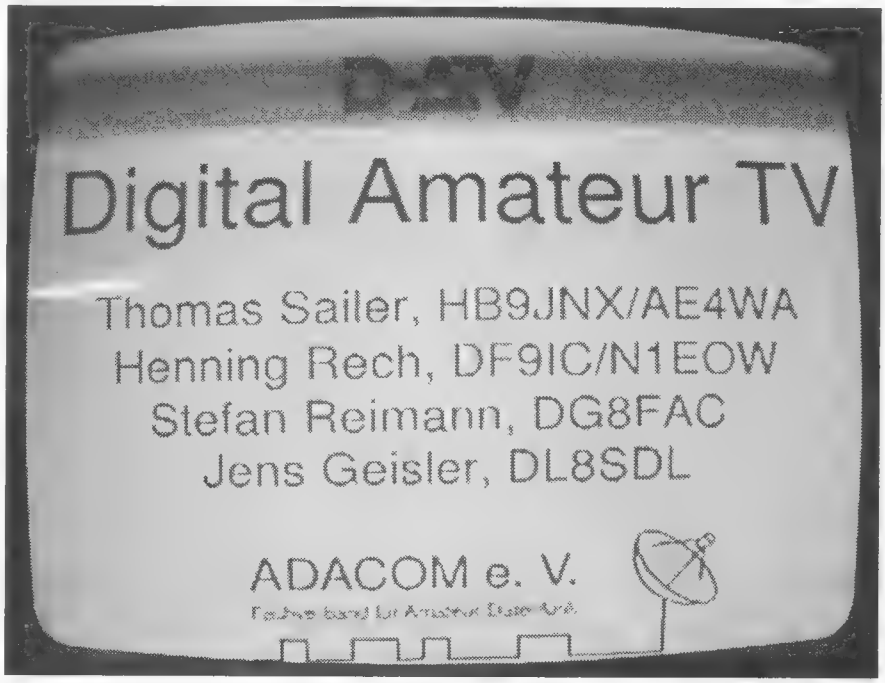
handbook for the Humax, teletext should have worked via the teletext decoder in the television receiver but we couldn't seem to make that work.

Further tests were then conducted from our repeater site at Ocean View about 54 km north of my QTH here in Brisbane. This produced astounding pictures, especially as we were only using +26 dBm from the transmitter. The transmit antenna used was a 36 element Yagi while the repeater receive antenna was a quad loop. Pictures were exchanged in both directions with the repeater also retransmitting on 426.25 MHz AM. It may be possible in the future to combine two M67715 power modules to provide some extra output while still maintaining the shoulders at around –28 dBc. It was decided not to use the M67762 power module due to poor intermod performance as is. Although I have seen some mention on the Web using this device with modifications to the bias circuit for an output power of around 3 w, no modification details were available.

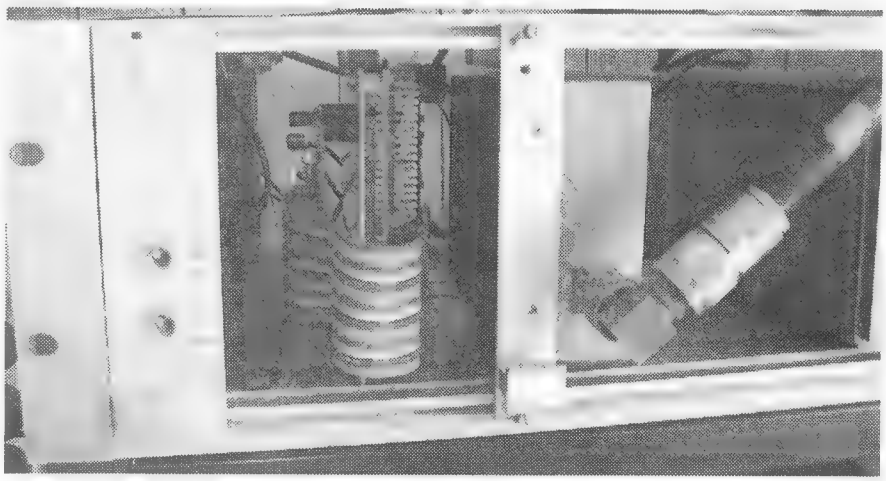
We also took the time to test a couple of class A amplifiers intended for UHF AM transmitters. These were TEKO units and the first unit consisted of a BFQ68 and a BFQ34 that had a gain of around 23 dB in normal operation. Checking on the data sheets revealed useable gain of 8.5dB and 8.8 dB respectively, an overall gain of 17db. Test results, however, showed only a gain of +11dB with an output of +17dBm for + 6dBm input. The second unit was fitted with a BFW34 and a useable gain at 1200 MHz of +7dB, according to the data sheets. With +6 dBm input an output of only +9 dBm was produced, a gain of only +3db! Total output from both units combined was +20 dBm for +6 dBm input, a total gain of only 14 dB. Further tests may be required to determine if better results can be obtained. One pleasing result was that the shoulders were at –38 dBc being due, of course, to the use of Class A type transistors which run on a +28 V supply. As a matter of interest the Marconi power-measuring unit showed an output power level of around +29 dBm whereas all other measurements were done on the Spectrum Analyser.

Further tests in the next few weeks will be carried out on 13 cm using a 2 W power amplifier and down-converter from Minikits here in Australia.

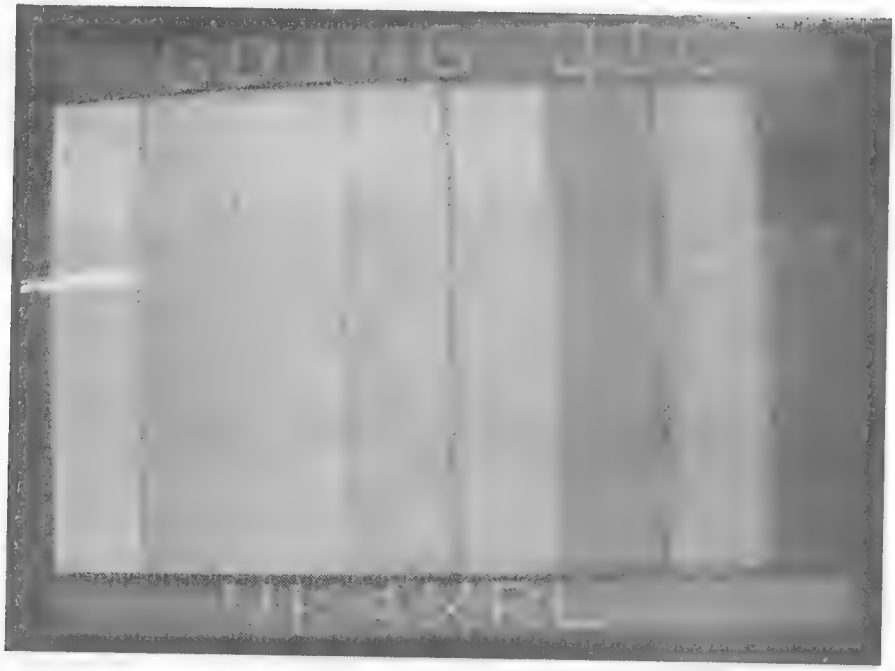
DATV Modulator



DATV Testpic



DATV Tx Unit



1st Received Picture

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Audio

The information in regard to what audio levels to use was non-existent. The specification sheet for the PM1800 indicates (incorrectly stated as Analog Output) that FS (VIN = 0 dB) or 2.828 Vp/p. Note that Vin should read 0 dBV. From my understanding FS = Full Scale and refers to the maximum level, ie analogue clip level. It is also known as FSD, Full Scale Digital. From what information I have, the system should be operating at around –18 dB which is the EBU standard. There seems to be quite some confusion in this area. I am now in the process of making an audio interface board with +/- 3 dB level control with LED readouts, etc for each transport system in use. Maybe someone could design a LCD screen with readouts using a PIC.

Sending 0 Vu from my audio desk was causing distortion, which was around 1.2v P/P. We set up a test using the local satellite Optus B3 which has a test channel with reference audio tones. This level was monitored on the CRO and noted. Then our transmission was monitored and the audio level adjusted for the same reading using the same receiver. The required input level was found to be 0.5 V P/P that is around –16 dBV. This confers with levels noted by Rob Krijsman.

Conclusions.

Overall the tests have been very impressive with most people agreeing they were the best ATV pictures ever seen, and commenting on the quality and lack of noise. The power amplifiers will be the biggest challenge, especially going up to the higher frequencies. Also, I must admit that I would have preferred an IF of 70 MHz and then up-converted as required. The 70 MHz signal could then be split to all up-converters or feed via cable to the antenna combined with up-converter and amplifier.

One minor point was the use of test cards or colour bars for testing. Since we are using digital transmission and the picture is either there or not there, the receiver can lock on as a still picture. I built a test generator using a PIC with scrolling ident and using the program called Monoset (V1.2) to change the scrolling text and callsign. Also, by use

of the push buttons, the callsign and clock can be alternatively switched. The encoder uses the Motorola MC1377 because I had one; however, future designs would use the AD722 as this has inbuilt filters. Also, it would have been nice if the line and sub-carrier relationship could have been locked. I found this more annoying than when viewing it in analog. Likewise, the Cropedy, or the newer version from G3RFL, can be made to switch several cards in an animation sequence.

One of the problems now encountered is the use of the computer to download required changes. Maybe a small microprocessor for control of minor functions with readout would be nice. While advocating the use of the computer around the shack for ATV activities, we now have to control DATV transmitters, Character Generators, OSD units, switchers, etc. How can we now control all these devices from the one computer?

I would like to take this opportunity to thank Stefan Reimann from SR-Systems, Arthur Lambriex EA5FIN and Rob Krijsman PE1CHY for their valued help and understanding during this period.

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(Part two of this article will appear in *Amateur Radio* December issue)

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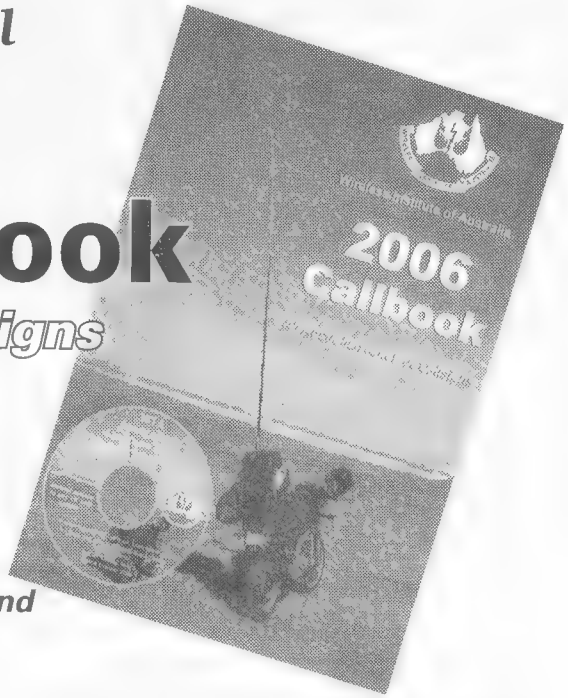

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All HF bands in one antenna installation

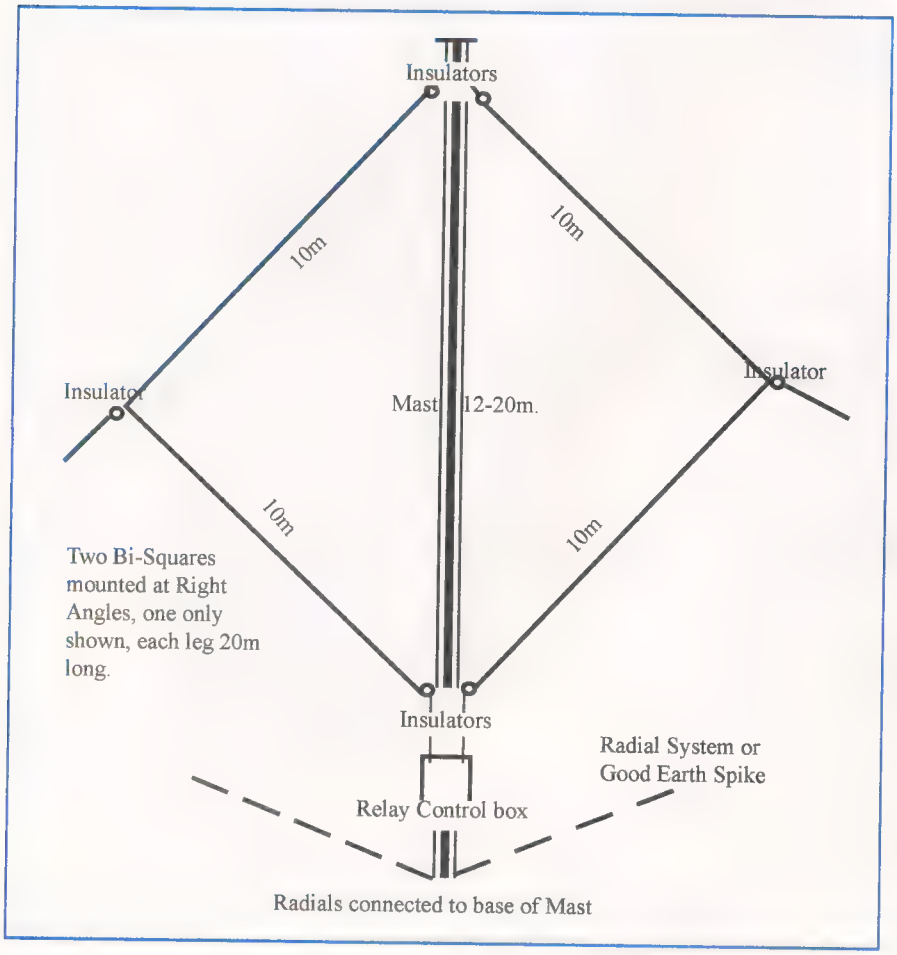
Don Haberecht VK2RS

In moving to a new QTH the writer was faced with the erection of a new antenna. It needed to be simple and easy to erect, preferably from a single mast or tower, needed to show gain and directivity on all HF Bands, and require minimal service attention.

A trial antenna was suspended from a 12 metre mast which worked very well on all bands except 160 and 80 metres. As much of my earlier DX activities had been restricted to these bands, because of a poor alpine location which limited the higher frequency bands, it was considered important that the design would, in fact, be an effective antenna on 160 and 80 metre DX. If the lower bands of 160 and 80 metres are not required then try a height of 12 metres or so and you will be pleasantly surprised.

Remembering early days, when rotary systems were few and far between, a Bi-square provided good gain, around 6-8 dB on the 20 metre design frequency and is bi-directional with a low radiation angle. Also, the lobe in both directions is quite broad on 40, 30 and 20 metres, sharpening on bands 17 to 10 metres, but still provides worthwhile gain and directivity.

An antenna tuner is necessary for multi-band operation. Radiation on 160 and 80 metres is vertically polarized, and horizontal on the higher frequencies when fed at the bottom of each Bi-square.



Practical construction

Two Bi-squares are used at right angles to each other, both fed at the bottom with all four legs open at the top. Each leg is 20 metres long and suspended from a 20 metre tower. At the centre point of each leg an insulator is attached allowing a tie point to pull out the leg to an angle of greater than 60 degrees. The true angle will depend on the location and desired height of the lower termination (feedpoint - about 3 metres in my case). It will now be quite obvious that the antenna itself helps to support the mast. The original test antenna had a reduced angle because of the lower pole height (12 metres). This worked very well on all the HF bands, except 160 and 80 metres with the base feedpoint about 2 metres above ground.

In theory, the stacking of two half wave antennas lowers the angle of radiation and provides a balance less reliant on height above ground, or an effective height equal to the midpoint height between the two half waves. The same theory applies to this antenna. It is important that the two Bi-squares are electrically identical in order that, when switching from one to the other, the impedance remains almost the same on each antennae for all bands. Adding a short length to the antenna which is high in frequency by trial will offset any major differences.

The original design included four double-pole relays mounted below the feedpoints in a waterproof box via equal length sections of open wire line, which made it convenient to adjust the length to match each antenna.

In the relay rest position the four legs were grounded for safety sake, or alternatively connected to a fifth relay which, when activated, selected the four legs together to form a four wire Umbrella Vertical tuned at the base

for 160 and 80 metres with a separate pi-coupler for 160 metres (see Amateur Radio, April 2005, page 14 for Drew Diamond's fine example). On 80 metres connect directly to the co-axial line at the control box by way of another relay On both 160 and 80 metres the ground system or earth spike becomes the return..

On the higher bands above 80 metres, when the leg relays were individually activated, it was possible to select any pair combination of the four legs and thus control the radiation direction with an improved front to back ratio. After four years of use it was found that the four compass directions were adequately covered, both short and long path, on all HF bands by the selection of one antenna or the other, thus simplifying switching. In the final outcome the switching is now done within the shack by feeding each antenna with identical lengths of open wire line to the aerial coupler via a double-pole heavy duty wafer switch.

For 160 and 80 metres the four legs of the open wire feed line are now bridged by two double-pole relays (within the shack) and fed to the antenna tuner. A good radial system below the antenna will improve the performance magically on both 160 and 80 metres - ideally four or more quarter wave radials buried beneath the ground.

In both 160 and 80 metre operation each antenna leg will carry equal current so the resistive losses will be reduced thus improving the radiation efficiency with a low angle of radiation.

Conclusion

The flexibility of the earlier system utilising relays at the base of the antenna allowed for better combinations, particularly on 20 metres and above where, by appropriate leg selection, there was increased forward gain and improved front to back ratio. In practice it was found that the simple selection of either Bi-square was the most reliable option and certainly the least confusing.

Final notes

It is wise to respect correct phasing. Ensure both right hand legs of either antenna are connected to corresponding antenna tuner input via the relays.

Both Bi-squares should be near symmetrical in shape. The actual shape may be determined by the proximity of objects. It may be that a triangular configuration suits your location better, or perhaps you may need to reduce the physical size of each square and this can be done by inserting stubs at each of the two tie off points (towards the mast). Whilst this is a compromise, the basic fundamentals of stacking and low angle are still maintained.

Over an active period spanning more than 50 years the writer has experimented with a multitude of wire antennae for single band and multi-band operation. This system provides a convenient option for multi-band operation with a single mast mount that is quite unobtrusive, usually an important consideration within the household. Don't forget to put your VHF antenna on top of the mast ..... have fun.

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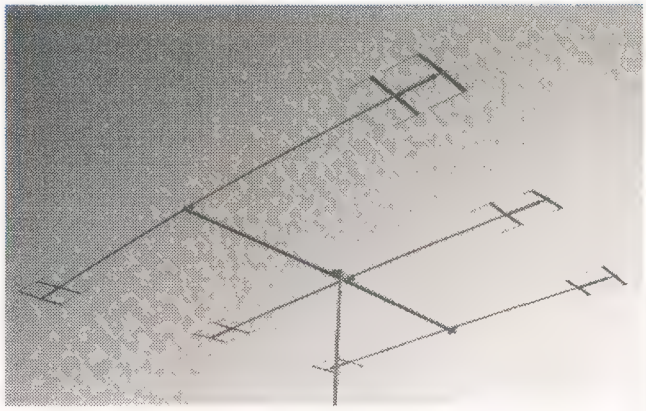

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Instant gratification

Bill Isdale VK4TWI

When we look at one of the recently designed radios on the market today we see a wonderful product of micro-electronic engineering. Many if not most of the components are surface-mounted devices, put in place by machines and soldered by a wave of molten solder, flowing over a circuit board in an oxygen-free environment. No uncertainty has been introduced by a human hand, which might be carrying some smudge of oil or some dust or simply tremble a bit. The automation of manufacturing has vastly increased the capability to deliver consistent quality and to shrink the size of components while placing them closer together, reducing unwanted losses and, for instance, stray capacitances between them.

The designers have, typically, produced a transceiver which will operate on the amateur bands from 160 m to 70 cm and will transmit up to 100 watts into a designated load of 50 ohms. What is delivered to us is a modern engineering marvel, which performs brilliantly and is very compact and inexpensive relative to its capabilities.

We could, just to show that we are capable, build our own radios, but the realities of what can be manufactured in even a well-equipped amateur's workshop would limit many of us to a simple device of modest capabilities. But where we can shine is in exploiting the capabilities of the radio we have bought.

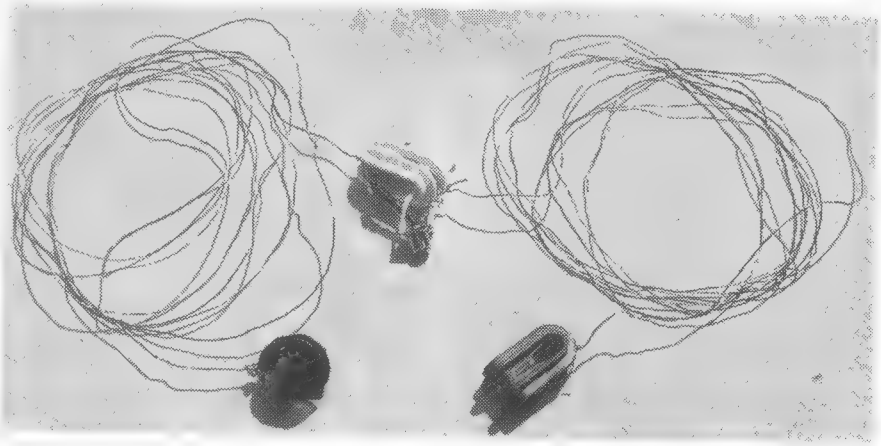

Photo 1 – The dipole rolled up and ready for transporting.

The radio usually comes to us ready to power up and operate. Power supplies can be built or bought to deliver what is needed, usually 12 volts or a little more of ripple-free direct current. We don't want wobbly input power upsetting the radio; the only oscillations we want are the ones that are put there deliberately to produce the radio frequency output. The critical part of our emerging radio station is often going to be what comes after the output connectors of the transceiver. To operate we must radiate and to do that we need a feed line and an antenna. This is where we have an opportunity to really excel.

The options are many in theory but may be substantially limited in practice. The best place for an antenna will be high above electrically-conductive and therefore radio-reflective ground. Those who live in a salt marsh on top of a mountain will have major natural advantages. Living by the sea will also be advantageous. Otherwise we must simply do the best that our location allows.

Height is important, to get clear of the interference of objects such as houses and to allow the radio waves to begin propagating in open space. There will be a significant loss to our signal if it is absorbed by, for instance, our house which is full of pipes and wires. Some people may find that the solution for them is to erect a tower which takes their antenna array up into clear space. There will be considerable expense involved with this and, I am bound to say, for some reason not everyone thinks towers are pleasing to look at. There are other options for putting up an antenna, among them using a skyhook in the form of a tree or perhaps a patriotic flagpole or simply a strong, light and cheap bamboo pole.

An antenna can be a well-engineered commercial model or we can achieve a lot for a small outlay of cash by building our own. The ideal antenna would be compact, light, durable and inexpensive, and would radiate efficiently from say 160 m to 70 cm. Anyone waiting to read how to build such a desirable antenna will have to wait a little longer because I don't know. I suspect that when someone works this out the word will travel very fast. For the present, I am going to look at how to achieve quite a lot for a little.

Many antenna designs of great elegance are available to achieve multi-band performance. Naturally enough they represent a number of compromises, sometimes requiring an antenna tuner to modify their input impedance to present a 50 ohm, purely resistive load to the radio. Radios are designed to operate into that particular standard load and their performance will degrade if they are not operated as specified.

What I am going to propose is how to get on the air quickly and inexpensively with good results. In order to do this it will be necessary to accept that no single antenna will provide good results across all the bands that our radio can handle. It is best to choose the band(s) where we want to operate and provide an antenna which does well there. It is much more achievable to design and build an antenna which performs well on one band than to try to make something operate on a number of different bands. The laws of physics simply cannot be broken.

At present, the sun is becoming

relatively quiet as it approaches the low point in its 11 year cycle of sunspot activity. A quieter sun means less ionisation of the upper atmosphere and less reflectivity to high frequency radio waves. However, we do know that the 20 m band provides the best overall reliability for long distance communication and will work quite well at present. If we build an antenna for 20 m then we will be able to expect some good results. The part of the 20 m band used for single side band voice communication is around 14.2 MHz so an antenna designed to work there will get us to where there will be active operators.

Putting up an antenna which is resonant at the desired frequency will produce a high return for our efforts. Resonance is easily achieved; we simply build an antenna of the right size. The reward is that it reacts to signals of that frequency very strongly, giving good performance both radiating and receiving. There is no need for an antenna tuner to mimic for the transmitter the load it was designed to operate into; and no loss in the antenna tuner itself. An antenna tuner, after all, despite its name, does not tune the antenna. Why would we think that, just because of its name? What it actually does is allow an antenna to be used outside the frequency range at which it is resonant. It does this by adding inductance and/or capacitance so that the impedance presented to the radio approximates a 50 ohm resistive load, into which the radio was designed to operate. The result is to make it possible to use the wrong antenna, not to make that antenna the correct size for its task.

The wavelength we wish to radiate and receive will determine the size of the antenna. A convenient formula to find the wavelength is to divide the radiation velocity (300 megametres/second) by the frequency in MHz. In this case, we have 300 / 14.2 = 21.13 metres. Divide this by 2 because we are designing a half-wave antenna, then multiply by 0.96 to allow for the reduced velocity of energy flowing in the radiating element. So the antenna length will be

$$\frac{21.13}{2} \times 0.96 = 10.14 \text{ metres.}$$

Copper wire is used as it is an excellent conductor. Gold is better but too soft and just a little expensive.

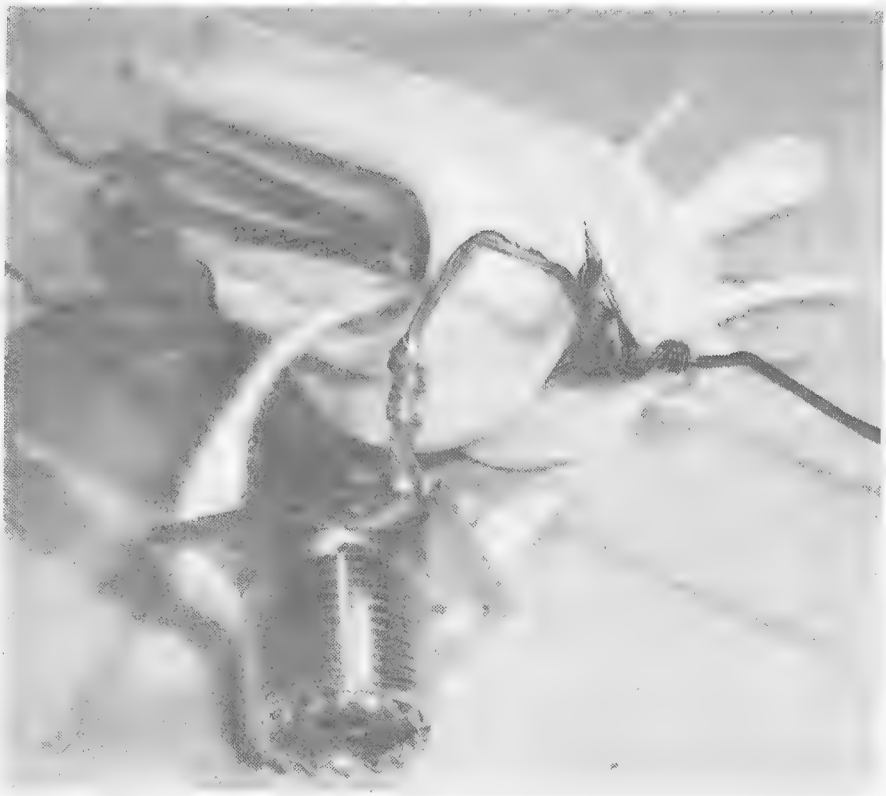

Photo 2 – An inexpensive connection between the dipole and the coaxial feeder.

The antenna design I am suggesting is a dipole so each side of the dipole will be 5.07 m long. Resonance is achieved from the quarter wave elements. The dipole, if in clear space for half a wavelength around it, will present a 72 ohm resistive input impedance. This isn't perfect but it is very good. It will, if connected to our transmitter, not radiate perfectly but will present standing waves, voltage peaks and troughs, along the feed line from the transmitter. This is not a problem so long as the situation is minimised. The ratio of the standing waves, the SWR, can be calculated from 72 divided by 50, which is 1.44. Such a SWR is not a problem and the transmitter will be able to work well with it. Do not be tempted to adjust the length of the radiating elements to try to improve the SWR, it cannot be better than 1.44 due to the nature of the antenna, and that is a good figure.

The energy surging into the antenna, at the radio frequency it is designed for, will produce a surrounding field. This field, in view of the size of the antenna which it has to occupy, just does not have time to collapse back into the antenna again when the oscillation is on its down-swing. It is still in space around the antenna when the next surge comes in and, since like polarities repel, it is pushed away from the antenna, off to see the world at the speed of light.

We must of course get the energy from the transmitter to the dipole. The ladder-type line works a treat, with very little loss. For many people, however, the co-axial line is more convenient. Ladder line is inherently balanced; the fields around the two conductors are complementary and do not radiate. Radiation does take place when, in effect, the two conductors are peeled apart to make the dipole. The two fields cannot reach each other to remain in balance and so are radiated. With co-axial cable, the two conductors are inherently in an unbalanced situation, one inside the other with insulation between them. There may be a tendency for energy to leak back along the shielding braid of the cable instead of being radiated by the antenna as planned. The transmission line then becomes an unintended part of the antenna and will mess up our calculations. Fortunately this is easily cured.

The radio frequency energy can be prevented from escaping down the shield of the co-axial cable by adding an inductance which will oppose it. A balun, a balanced to unbalanced transformer, will keep the balanced

antenna from being degraded by the unbalanced feed line. Baluns can be bought or made. For present purposes a simple and effective choke balun can be constructed by coiling up the cable just below where it feeds the antenna. About four turns to form a circle around 200 mm in diameter will choke off the flow of energy back along the cable shielding. The coil can be maintained in shape with, for instance, some small cable ties, the black ones which can survive outside fairly well.

For a big improvement in simplicity and performance, we can exploit the fact that a transmission line will present, at its input, exactly the same impedance which it sees at its output when its length happens to be half the wavelength of the signal it is carrying. It may not be possible to build to this length and still join your operating position to the antenna location but if it can be done it is a simple and effective way to match the radio to its feed line. For our antenna, the half wave length is 10.14 m. Bearing in mind that co-axial cable, because of its design, has a velocity factor of, commonly, 0.66, it is necessary to find 0.66 of 10.14 m , which is 6.69 m. A feed line of that length will not add any complexity of its own but will simply allow the transmitter to "see" the 72 ohms at the antenna feed-point. This will produce a 1.44 SWR and work very well. There is no need for an antenna tuner and a simple and effective resonant antenna system has been achieved.

The radiation pattern of a dipole can be imagined as a doughnut shape with the wire running through the hole in the middle. This makes it directional in that it works best to its sides, and not well off its ends. This can be taken into account in positioning it.

A key construction element is the join between the dipole and the co-axial line. An inexpensive connector such as the panel socket square mount SO 239 costs under $3 and will allow the two sides of the dipole to be joined to it, one to its centre pin and the other to one of its holes meant to take mounting screws (see photo 2). The gauge of the wire for the dipole can be what will solder easily to the connector and is as large as convenient so it has some strength. Each outer end of the dipole can be wrapped onto a plastic insulator such as is available inexpensively, usually in packages of more than we really need, at produce shops which sell them for use in electric stock fences. An insulator can be placed in the centre to take the strain of each side of the dipole and the wires can then be taken down to the connector so that the soldered joints take no strain. The weight of the co-axial cable, hanging vertically below, can also be taken by some insulating cord (a nylon shoe-lace works well; again see photo 2) that passes through the spare holes in the connector and ties onto the central insulator. Some self-amalgamating tape can be used to try to keep rain out of the connector.

The measurements of each side of the dipole can be taken from the join at the connector to the furthest point out on the ends, using a tape measure. Disregard the fact that the wire is twisted up in places for mechanical reasons; it is the overall length of the wire as you are looking at it that counts. Joining the dipole wire to the insulators can be done simply by twisting it a few times. When cutting the dipole you can leave about 300 mm extra on both of the lengths of wire so that you have plenty to work with when building. You can wrap the wire on the insulator until the overall length of exposed wire is the correct length and then trim off any excess. It does not matter for practical purposes that the length is partly achieved by a twisted bit of wire.

An option for maximum simplicity would be to discard the outer end insulators. The outboard ends of wire can be twisted and perhaps soldered into a small loop, the overall length of the wire being the desired one. The dipole can then be suspended from these loops by some suitable plastic cord, which provides the necessary insulation to the high voltage present on the end of the wires.

When hanging the antenna, it will be found to work best if kept clear of objects as far as possible and put up as high as possible, oriented so that its radiation pattern is in the direction you want to exploit. This will be so that the side of the wire is in the desired direction.

Remember to think of safety and the requirements to minimise radio frequency energy around people. Any antenna should be disconnected when not in use to avoid the danger of a lightning strike destroying the radio.

The antenna is suitable for carrying rolled up (see photo 1) in a small bag and is useful for quickly getting on the air wherever you happen to be.

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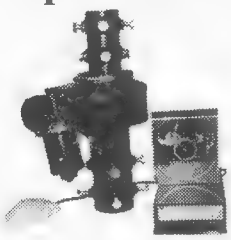

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Making shunts for ammeters

Drew Diamond VK3XU
Photos: Andrew Diamond

When planning a dc power supply, or maybe a linear amplifier project, it is often found that an ammeter of the required range is not available, and so a more popular meter must be adapted for the job. Some common sensitivities are 50, 100, 250, 500 µA and 1 mA full-scale deflection (fsd), whereas, we may need a meter to measure perhaps 1, 5, 10, even 25 Adc. The usual solution is to "shunt" the meter's coil with a parallel resistance of appropriate value (Refs. 1 and 2).

Unfortunately, recent amateur literature (eg Refs 1, 2, 3 and 4) has routinely suggested copper or nichrome wire as the shunt material, both of which are far less than ideal for this application. Certainly, copper wire is cheap, plentiful and solderable, but, due to the heating effect of larger current values, the high positive temperature coefficient* (*see note at end of article)* of copper makes it quite unsuitable for accurate measurements.

Nichrome (an alloy of nickel and chrome) has a very low temperature coefficient, is readily available from electronics suppliers, also being salvageable from defunct electrical appliances such as heaters and hair dryers. However, without special equipment, it is very difficult to soft-solder. And a crimped or wire-wrap type connection (of the shunt wire) may well not hold its resistance value over time.

The most ideal material is probably manganin wire. Being a correctly proportioned alloy of copper, manganese and nickel, it has an extremely low temperature coefficient and solders beautifully. Sadly, it is not readily available in small quantities from the usual electronics suppliers.

Fortunately, Dick Smith Electronics sell "Cuprothal" resistance wire, supplied as 4 metres of # 28 B&S (Item number W - 3200, no longer listed in their catalogue, but known to be still generally available). Cuprothal (a trade name) is an alloy of copper and nickel, has very low temperature coefficient of resistance, and solders well, which makes it quite suitable for use in making ammeter shunts.

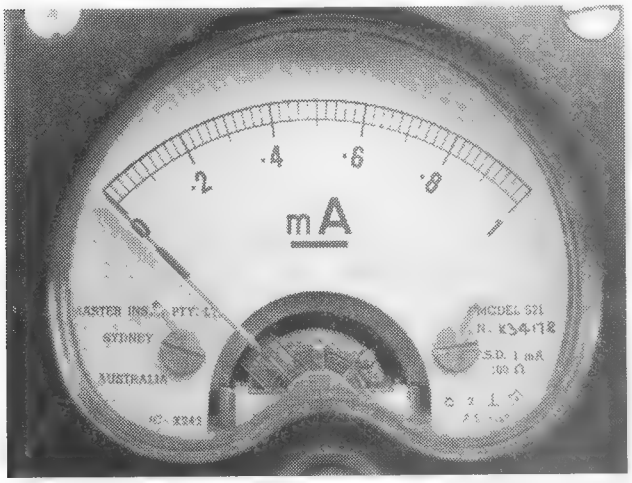

Photo 1 - Typical meter face bearing relevant information.

Finding the resistance of a meter

In order to make a shunt, we need to know two things; the resistance of the meter's coil, and its basic fsd sensitivity. Many of the better class meters have the

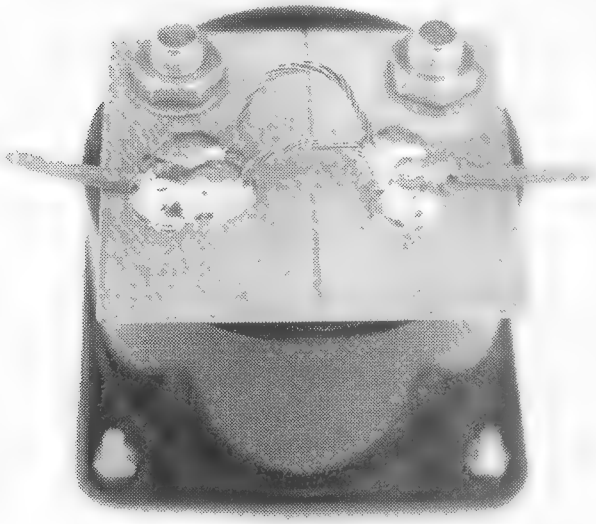

Photo 2 - 10 A shunt.

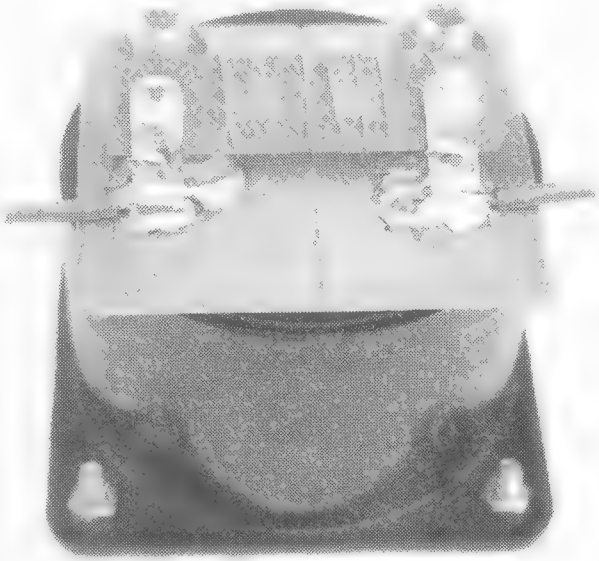

Photo 3 - 100 mA shunt.

resistance and other information marked upon the lower area of the meter's face (Photo 1). In such cases it is not usually necessary to actually measure the resistance of the coil.

Before any work is done, it would be sensible to check that the meter is indeed serviceable. A variable dc power supply is an ideal voltage source for such tests. The Meter Under Test (MUT) is configured first as a simple dc voltmeter, as shown in Fig 1. Calculate the value of resistance needed to allow a current equal to the meter's fsd to flow from (say) a 12 Vdc supply. For example, a 1 mA meter will need a series resistance (ignoring the meter's resistance for now) of:

$$R = \frac{E}{I} = \frac{12}{0.001} = 12{,}000\ \Omega.$$

(Abbreviated to 12kΩ)

The meter may be hooked up to the 12 Vdc supply with a 12 k "multiplier" resistor in series. A reading of something close to fsd should be obtained. If possible, slowly vary the supply voltage down towards zero, then back up again, and observe that the meter's needle moves smoothly, with no sign of stickiness.

If the coil resistance is unknown, configure the meter as for the test described above, but with the addition of a series Test Multimeter (TM), set to measure a current value inclusive of the fsd of the meter under test (see Fig 2).

Adjust the dc supply voltage so that the unknown meter reads fsd, whereupon the series multimeter shall indicate the actual value of current flowing, and thus verify the basic sensitivity of the meter.

Using a sensitive Digital MultiMeter (DMM), carefully measure the dc voltage drop Em across the meter's coil. For my 1 mA (0.001 A) meter in this example, the drop is found to be 0.1 Vdc:

$$Rm = \frac{Em}{Im} = \frac{0.1}{0.001} = 100$$

thus confirming that the coil resistance is indeed 100 ohms.

Calculating Shunt Resistance

It is interesting to derive a suitable formula from Ohms Law. Since the shunt is in parallel with the coil, the same voltage E appears across each. Therefore

E = Im x Rm = Is x Rs

where Im is the current through the meter's coil, Rm is the coil resistance, Is is the current through the shunt, and Rs is the resistance of the shunt. Since

Im x Rm = Is x Rs

then by re-arranging for Rs as the unknown, we find that

$$Rs = \frac{(Im \times Rm)}{Is}$$

We want to know the value of resistance necessary to "shunt" the bulk of the current to be measured around the coil, and so, to be exact, for a measured current of I, Is will be (I - Im). The precise formula is therefore

$$Rs = \frac{Im \times Rm}{I - Im}$$

An often quoted formula, derived directly from the previous formula is

$$Rs = \frac{Rm}{(N-1)} \qquad \text{...(Refs 1and 2)}$$

where N is the ratio I : Im (in the same units).

However, in most practical instances, where the coil current is over 100 times smaller than the shunt current, (I - Im) can be taken to be simply I.

So our simplified formula becomes

$$Rs = \frac{Im \times Rm}{I}$$

As a first example, let's suppose we need to shunt my meter to read 100 mA (0.1 A) fsd.

Substituting;

$$Rs = \frac{0.001 \times 100}{0.1} = 1.0\ \Omega$$

Where the ohms per metre of the wire is known; length of wire needed to obtain a certain resistance is

(l)ength mm = (1000 x Rs)/ohms per metre

Resistance of the wire is 6 ohms per metre. We need 1.0 ohm. Therefore

$$l\ mm = \frac{1000 \times 1}{6} = 167\ mm.$$

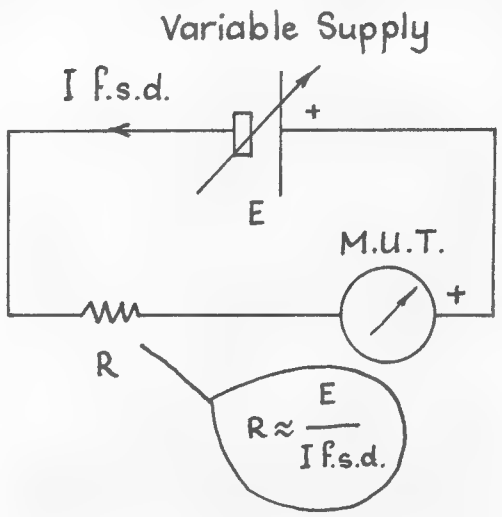

Fig. 1

Check Meter f.s.d. Sensitivity.

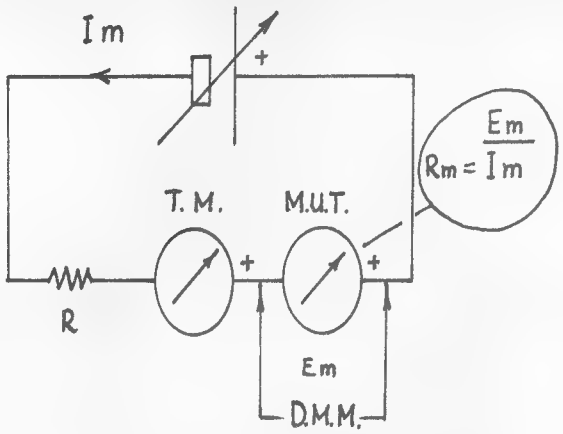

Fig. 2

Determine Meter Coil Resistance.

Making a shunt

We should use some kind of former to accommodate the shunt wire. As the wire is not coated, the turns must be space wound so that they cannot move or short together. Photo 2 illustrates a suggested method using a length of tag strip. Two tags have been removed from the strip, which allows 167 mm (plus terminating tails) of shunt resistance wire to be wound on.

The shunt may then be soldered upon a suitably sized and drilled rectangle of single-sided printed circuit board which in turn is mounted onto the meter's rear terminals as shown. Note the single shallow hack-saw cut along the centre of the board.

Care must be taken so that no "spurious" extra resistance becomes included with the shunt resistance. Therefore, when the meter and shunt are wired into circuit, it is important that the connecting wires be soldered right at the shunt connections, as illustrated in Photo 2.

Accuracy of the meter and shunt may be tested in the set-up shown in Fig. 3. Variable power supply and/or series resistor R are adjusted for fsd, whereupon the two meters should closely agree.

In the next example, let's look at shunting the same 1 mA meter to read 10 A fsd.

By experiment it is found that the #28 B&S Cuprothal wire fuses at about 7 A, but is easily capable of carrying 1 A without significant heating. I want the shunt to carry 10 A, so I shall use 10 parallel strands for the job.

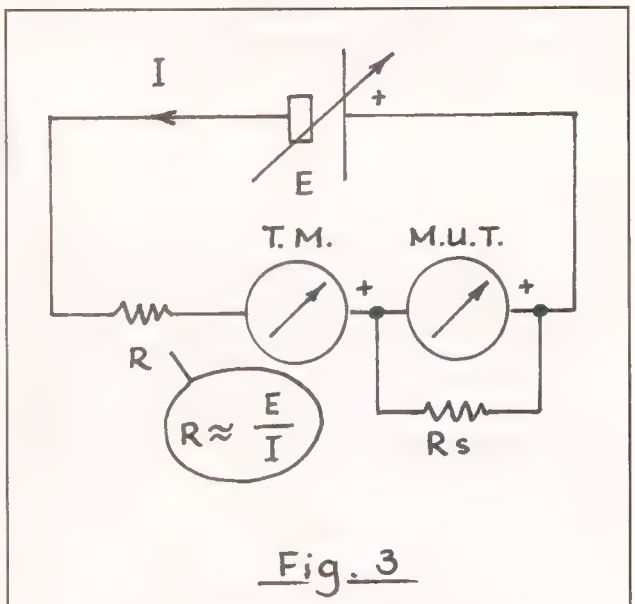

Fig. 3
Test Accuracy.

The shunt resistance needs to be;
Rs = .001 x 100/10 = 0.01 Ω

However, since 10 strands of wire are to be used, each strand shall carry 1 A, so we simply calculate as for a 1 A shunt;
Rs = .001 x 100/1 = 0.1 Ω

Actual length of each shunt wire is

continued on page 38

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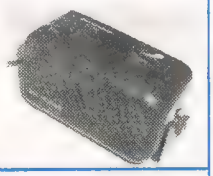

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News from...

VK2

Tim VK2ZTM

Quite a bit of activity this month. The equipment tender for members of AR-NSW will close on Friday the 11th. Check the web site at www.arnsw.org.au Equipment will be available for collection by those successful at the November - Trash and Treasure - that will be held at VK2WI - Dural. The only controlling factor will be the weather. If it is doubtful, VK2WI will advise at 10 am - Sunday 27th - and the event may be reverted to Parramatta.

This month on Saturday the 19th. the club conference with the WIA and AR-NSW is scheduled to be held at Amateur Radio House - Parramatta. On Sunday, the 13th, Westlakes have their field day.

By now, the office hours at Parramatta may have been reduced to a couple of days a week. The VK2WI news sessions will advise the days for each week. If you are coming from some distance, you should always check ahead to see if the office is attended - telephone 02 9689 2417. The VK2 Bookshop activities will become a function of the National WIA. There is some stock left as these notes were prepared, which may be only be purchased by personal office sales.

WICEN [NSW] Inc, in a news item early October, reminded current and old members that the State Government was planning legislation to make it an offence to wear uniforms of or display insignias of emergency services, if one is not authorised to do so. As WICEN is a member squad of the VRA, it would appear that they are covered by this intended move. In other words, those former members of WICEN, including unfinancial members, would not be able to just slap their old signs on their cars and go swanning through a road-block, so perhaps they could consider re-joining WICEN instead.

The automatic morse transmission from VK2WI on 3699 kHz is going well on its new keyer. Some additional text is being planned, which will include some examples of how an 'on air contact' is conducted, including the short hand and abbreviations. This is an invitation for those who make CW contacts to provide examples of such contacts. We are looking for script of DX contacts, contest working and general rag chewing. If you would like to provide such examples, you can e-mail them to vk2wi@ozemail.com.au , identify them as 'Morse examples' or by mail to P. O. Box 9423 Harris Park NSW 2150.

For those who prefer live Morse training, you can find the service provided by several Amateurs on 80 metres under the call VK2BWI. They are there several evenings per week at 2000 hours VK2 time - conditions permitting. If you would like to assist with this service, contact Ross VK2ER who has the slot of Thursday. The method of operation is to come up on voice, introduce the next piece of text and then send the Morse. At the end of the piece, there is a read back. Operating tips are also given. Callbacks are also taken and you are invited to call in, if possible. There are also several clubs and individuals that provide either on air or classroom training. Please advise so that we can give your efforts publicity.

As the solar conditions head for the bottom of the present cycle, it has been making HF coverage by VK2WI difficult. On a couple of occasions, the HF portion of a morning session was washed out. On one occasion there was a replay of the session made on the following Tuesday evening. This approach may be taken on future occasions, when practical. VK2WI news is a real time production, so it is currently proving difficult to provide reliable signals to the relay stations operating beyond the linked repeaters. We thank those relay stations for the effort they go to trying to retrieve an HF signal. VK2WI is looking for more Announcers and Engineers to join the team; the numbers are down a bit at the moment. Pat VK2JPA has retired from the evening roster after many years of involvement. Many thanks to Pat for her efforts. Get in touch with John VK2JJX or the Parramatta office if you can assist.

Many clubs make use of the VK2WI news facilities to promote their club activities. We invite others to also use the service to advise their activities. We would like all clubs to let us know their meeting dates for 2006, so they can be included in the 'coming events'. Send your items, early in the week, via e-mail to vk2wi@ozemail.com.au or postal to P.O. Box 9432, Harris Park, 2150.

73 for this month de Tim VK2ZTM.

The Central Coast Field Day 2006 adds YLs' section

19th February 2006

This year the Central Coast Field Day Committee is trying something a little different. This year there is to be a section of the Field Day allocated to the ladies.

Hi, my name is Maeva Bennett, VK2HUG, and I am the co-ordinator for the Ladies' Section of the Field Day. My aim is to try to find things of interest to attract women to the Field Day by organising a Craft Show incorporating demonstrations, workshops, displays and retailers of craft supplies.

We have been allocated the top (air conditioned) floor of the Racecourse building to hold our Craft Show, and I hope to organise about 4 workshops to be run over a period of about 1½ hours - these workshops will include Bead Jewellery Making, Quilting for Beginners, Rag Doll Face-making, sculpting and painting and another to be decided. The cost of the workshops is free but you will have to purchase a "kit" at cost price so that at the end of the workshop, you will have not only learnt something new but you will have done hands on practice and have your item to take home as an example for later examination. The number of participants in each workshop will be limited to allow for individual assistance

and to give the ultimate in your learning experience of each of the crafts.

I am approaching various retailers to participate in the day, by making available their stock of craft supplies for sale on the day as well as presenting demonstrations of the latest gadgets, techniques and materials available to those who enjoy their crafts.

There will also be a display of the Crafts that we crafty ALARA members and XYL's do, while not on the radio or making cups of tea for the male members of our family. If you would like any of your work displayed please contact me at any time, remember it's the Ladies Field Day and it's our chance to get involved in our hobbies and interests.

If you would like to participate in the workshops, have any ideas of what you would like to see or do, would like to present a workshop or display your creations, please contact me.

It's up to us to make it a success, and I have noticed over the past years that we ladies are a crafty bunch, let's get the best out of the day for all of us – radio and craft – the best of all worlds.

Maeva Bennett VK2HUG
Internet: vk2aal@comcen.com.au
Phone: 0242 976065
Radio Coast Lind Repeater 146.850, IRLP Node 6018

VK5

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

Unfortunately the talk on satellite communication had to be delayed but members were entertained by a talk given by Jim VK5NB based on his experiences with towers when he worked for the old PMG.

There were photos to illustrate different types of towers and even some that showed the damage caused by storms or (occasionally) faulty design.

The new venue for the meetings seems to be working quite well and no one has got lost, so far.

If you are visiting VK5 please come along to a meeting on the third Thursday of the month (except for July and Dec – and maybe January). Contact President Jim VK5NB or Secretary Leith VK5QH QTH the Callbook for information.

If you would like to hear one of the lectures mentioned in this column you may be able to borrow a video of it. Greg VK5ZBD videos each lecture for us so we have quite an interesting collection, now. As AHARS is a large club it is easier to attract lecturers than is possible for the smaller clubs. The cost of borrowing is minimal. Contact either Jim or Leith for details

VK6

Operation of VK6WIA in RD Contest.

Right: Mal Johnstone VK6LC operating VK6WIA at his aerial farm at Crossman WA.

Below: The VK6LC aerials at dusk

News from...

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: reast.asn.au

2005 Sewing Circle BBQ

By the time you read this, many would have had a great time at the Sewing Circle B.B.Q. Ken, VK7DY and family hosted the event at their property at Orielton - 30 kms east of Hobart on November 6. This is an annual event, which attracts many VK7 and interstate visitors. It is a field day BBQ and most importantly the day that the Sewing Machine Award is presented to the operator most worthy of this prestigious award!

VK7 EME DXpedition

Rex, VK7MO spent a couple of weeks on Cocos-Keeling and Christmas Islands in the Indian Ocean using 2 metres and 70 cm and the digital mode JT65 included in Joe Taylor's (K1JT) WSJT program for moon bounce (EME) operation. Rex made 156 contacts on 2 metres and 8 contacts on 70 cms from these rare DXCC locations. Congratulations Rex on this unique DXpedition.

IOTA DXpedition

VK7FLI was active on OC195, Flinders Island from 19-23 October on 80, 40 and 20 m. QSL cards can be sent via Allan, VK7AN or Barry, VK7BE.

VK7 BPL trial starts

The Aurora Energy trial is being watched very closely with many measurements being taken and interference levels being closely monitored. There have been many letters to the editor appearing in Tasmanian newspapers and a feature on the ABC Tasmania Stateline program. Phil Wait, VK2DKN, Phil Thompson, VK7SS and yours truly have also met with the State Energy Minister Brian Green MHA to express our concern at the technology. There are many outrageous claims being made about the amateur service so, we encourage all amateurs and interested people to take a look at the REAST website and familiarize yourself with BPL technology, what it sounds like on the air, what it looks like on the poles and if you are experiencing interference that you believe is BPL then make a complaint to Aurora Energy and ACMA as per the ACMA guidelines.

North West Tasmania Amateur Radio Interest Group

Planning is underway for the centenary celebration of the first Marconi Radio Transmission across Bass Strait. Devonport to Queenscliff in Victoria in July 1906. NWTARIG in conjunction with the Devonport City Council and the Geelong Amateur Radio Club and various shires and public utilities in the Queenscliff and Geelong areas will be involved.

The North West now has it's own IRLP Node thanks to Tony, VK7AX. Node Number 6124 is linked to the 2 metre repeater VK7RNW at Lonah. Facilities include broadcast file replays, voicemail, weather reports and time checks. EchoIRLP facilities are also anticipated.

Shirley VK7HSC is a regular participant in the IRLP YL Friendship net which takes place on the first and third Sundays using reflector 9258 at 0800 local (EDST). There have been over 26 stations and 7 countries involved. OMs are most welcome, so feel free to join us, Shirley reports.

Northern Tasmanian Amateur Radio Club

The October meeting was a dinner meeting with partners and the guest speaker was Mr Tony Hart from Centrelink. Tony presented some very useful information for those nearing or contemplating retirement. Tony also answered many questions about what you can and can't do with those dollars you've been siphoning away! A most enjoyable night.

Radio and Electronics Association of Southern Tasmania Inc.

Roger, VK7XRN reminds us of a significant REAST milestone, our 75th member, welcome aboard, Myles VK7MF. Socially we are going well. You only have to visit the clubrooms for the Wednesday lunchtime gatherings to gain an appreciation of that dimension. Visits are well attended. Small special interest groups are very active too. Repeaters, computers, homebrew, ATV, WLAN, just to name a few!

Reg, VK7KK has returned from a 2 day training seminar in Sydney and is chaffing at the bit to get going with assessing the Foundation Licence and the new Amateur Syllabi.

Repeater 2 (146.7 MHz) is now being tested from the Domain and the 70 cm output remains on air at Guy Fawkes via the old R2 receiver and antenna. Reports so far about the new locations' coverage are good and the picture is building. Brian, VK7BW has graciously lent us the use of his WICEN R15 repeater for the new Snug Tiers site and this is on test, transmitting on 147.950 and receiving on 146.150 MHz with a 151.4 Hz access tone.

Our October visit was to the Communications and Major Incidents rooms at Tasmania Police in Hobart. Thanks to Duty Sergeant Pat Lee and Inspector David Chambers for organising this fascinating tour. I think many people came away from the tour with increased respect for the police communications operators who each handle something like 200-300 calls on a shift!

VK3

Barry Robinson VK3JBR
Website: www.amateurradio.com.au
Email: arv@amateurradio.com.au

Foundation callsigns on air

A very warm welcome is extended to those who have entered amateur radio via the new Foundation Licence. Members are encouraged to provide on air support and where possible some mentoring for them.

Make their introduction to the amateur bands memorable as they explore what our hobby has to offer. Amateur Radio Victoria is available to assist any newcomer or those interested in joining the amateur radio community.

Member input being sought

At the Amateur Radio Victoria AGM on 25 May, there was discussion about the role of our statewide organisation, the need to review membership services and consider potential member involvement activities.

A number of members at the AGM indicated that they were willing to take part in a whiteboard think-tank session, throw around a few ideas and consider the suggestions of other members.

Amateur Radio Victoria, since the collapse of the WIA federation in mid-2004, has built up a membership base in excess of 600 members and is financially sound.

Now all members are being invited to submit their views and suggest topics that could be examined in the exercise to determine the future direction of their organisation.

This is an important exercise. It does not matter where you're located, or if you are able or not to attend the think-tank session, please provide your thoughts now. These can be by letter, fax or email.

It may help to ask two simple questions:

1. *"What do I want Amateur Radio Victoria to do?"*

   (Consider its uniqueness of being both a statewide organisation and having its office located in the centre of Greater Melbourne. A new era has begun with licence restructure creating opportunities and challenges.)

2. *"What do I like or not like about Amateur Radio Victoria?"*

   The responses received will be used to compile an agenda for the think-tank session to be held on Saturday 19 November.

Support for the hobby

Amateur Radio Victoria at its recent Council meeting carefully considered three requests for assistance for works needed on voice repeaters at Bendigo, Geelong and East Gippsland.

The Midland Amateur Radio Club, Geelong Amateur Radio Club and East Gippsland sought help because the repeaters they maintain are part of the Amateur Radio Victoria network, and the funding required is outside the scope of their finances.

In relation to those projects, Amateur Radio Victoria funding will be around $2,000 this calendar year and in 2006 more than $4,070. In addition, we budget for around $5,000 a year for repeater site leases and power, $4,000 licence fees, plus $2,000 for maintenance.

The members of Amateur Radio Victoria contribute to these and other services through their membership subscriptions.

Election and end of year arrangements

With the retirements of at least two councillors there will be vacancies on the Amateur Radio Victoria Council for the 2006-2009 elections.

Nominations that can be made on a form available from the Secretary are now open and close at 2.30pm on Thursday 23 February, 2006. Notices of Motion for the AGM to be held on Wednesday 24 May, 2006, close on the same day.

The last day of the year for our office is Tuesday 20 December, 2005 and it reopens Tuesday 7 February, 2006.

John Brown VK3JJB will retire from his position as Company Secretary at the end of his term. A replacement is needed from within the membership and ideally identified now so that a smooth hand-over can occur. Anyone interested to learn more should contact the President, Jim Linton VK3PC.

Special event stations

ACMA has responded positively to Amateur Radio Victoria's requests for special event callsigns for use in relation to celebrating next year's Commonwealth Games.

Two callsigns, AX3MCG (Melbourne Commonwealth Games) and AX3GAMES have now been issued. The plan is to have a set of commemorative QSL cards for both callsigns.

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News from...

Geelong Radio and Electronics Society (GRES)

The third quarter of this year started with our annual general meeting. The office bearers for the 2005/6 year are President Keith VK3AFI, vice President Neil VK3XLJ, Secretary Keith VK3XKS, Treasurer John VK3TKH. The ordinary committee members are Garry VK3SZ, John VK3HJS, Neil VK3XNH, Albert VK3EFO, and Ranko VK3WDX.

Earlier in the year, the club purchased a commercial antenna analyser. This meter covers all amateur bands up to 70cm. Keith Vriens VK3AFI spent one evening explaining the theory of operation and uses of the analyser. This was followed up over two meeting nights by members using the meter to check out their home brew HF "screwdiver antennas". This piece of test equipment (like all our test equipment) is available for members to borrow. So far many members have borrowed it to check out their home station antennas.

One meeting night was devoted to the programming of "picaxe" chips. This was done under the instruction of John VK3TKH. Use was made of our 8 personal computers. Each computer had an additional monitor beside it. This monitor was connected through a video splitter and displayed the screen of the main computer that John was using. In this way he was able to give instructions to all on how to program the chip. After checking the program by computer simulation, the program was loaded into a picaxe chip and tested by running it. All who took part in the evening were given, for their own personal use, a CD containing relevant picaxe information.

We had one visit for the quarter. This was to the Belmont Fire Station. The emphasis was on communication. The fire officers explained how emergency communications were set up. We were shown their mobile communications van which utilises VHF/UHF radios in addition to fax and phone. The vehicle has its own power generator. Because most of our members are active in WICEN the evening was most informative.

Another interesting evening was "show and tell". Members brought along their latest homebrew projects. These included a battery charger using discarded electric blanket transformers. Other items shown were field strength and SWR meters, a pattern generator and an RF attenuator.

Our Wednesday morning group are still kept busy with various projects. This group has been assessing donated items for their historical value. These items are either restored for inclusion in our museum or put to one side for sale by auction in the future. A new computer has been built and commissioned. This will be used for e-mail and Internet access, as well as running programs of interest to club members.

As part of their "activities", one local scout group has made use of our workshop facilities. Two groups of 15 scouts over 2 nights made a flip-flop flashing LED circuit. Each participant was able to correctly assemble the circuit board and get it operating correctly. Once the project was finished they were allowed to keep the circuit board.

On the first and third Friday of each month there is a meeting of the computer group. These are informal meetings where interested members gather to discuss computer related topics. It is also a self help group. If a person has a computer problem, that problem can be solved by drawing on the combined expertise of the group members.

Club meetings are held every Thursday evening at the clubrooms. These are situated at 237B High Street Belmont commencing at 8 PM local time. Visitors are most welcome.

Rod Green VK3AYQ

Silent key

Jim Watt VK3KBG

21-7-25 – 12-10-05

Members of the East Gippsland Amateur Radio Club at Bairnsdale and his many friends in the Latrobe Valley will be saddened at the passing of Jim on Wednesday 12th Oct in the Bairnsdale hospital after a short illness.

Jim began his interest in radio on the 27 MHz band before the days of it being a legal CB band. He was a very active member of the Latrobe Valley GL club in those early days. He later made the move to amateur radio with his current call sign and was active for many years from his home in Morwell. Jim was a courteous operator and always had a kind word for all comers.

Jim also had another interest in boating and owned a motor cruiser at Paynesville. For many years Jim and his wife Mavis (deceased) spent most of their weekends and all of their holidays cruising the Gippsland Lakes and made many friends at the Paynesville Motor Cruiser Club where he was made a life member.

After the death of his wife Jim sold up the house at Morwell, bought a larger boat and lived full time on the water. In recent years Jim had the misfortune to have one leg amputated which made life on the boat very difficult.

Jim will be remembered as a kind and thoughtful person who enjoyed life despite his many health problems.

Our sympathies are with sons Jim, Greg and Phil and their families.

Bob Neal. VK3ZAN.
Secretary EGARC.

Christine Taylor VK5CTY

Contest logs

Well, by the time you read this it will be too late to send in your logs for the ALARA Contest, but there is another use to which you can put those contacts.

In how many different VK states did you contact YLs? If there were five different states and you have made ten or more contacts with VK YLs you can send off for an ALARA Award. It is an attractive addition to your collection and worth the effort. DX operators need only five contacts from four different VK Call areas.

We have a new Awards Custodian, Kathy VK3XBA QTHR the call book. Why not drop her a note including $A5 or 4 IRCs. She will be delighted to have some work to do.

If you already have the Award but have made some new VK contacts, there are endorsement stickers for the extra 10 stations for VK operators or 5 for DX operators available for just $A1.

In the bush chapel. Jenny Zietz in the pulpit, Dot VK2DB sitting in the minister's chair and Raija SM0HNV standing nearby.

The ALARAmeet

As we expected, Marilyn did a great job arranging an interesting and busy ALARAmeet in Mildura. Fifty of us enjoyed lots of talk and some interesting and varied places in and around Mildura.

As usual there was a pre-Meet dinner on the Friday at which there were nearly as many as there were for the official dinner on the Saturday night. Marilyn had planned the meals so that alternate places were served different food both on Friday and Saturday. We could exchange our plates if we wished, of course, as some people did.

Not everyone had encountered this idea before but it makes quite a difference in cost, as we can understand. The kitchen does not have to over-order to cater for choices, at all. Ordering food for any restaurant must be a nightmare. The food and the choices Marilyn made for us all through the weekend were very good, everyone agreed.

The main venue for the ALARAmeet was in a conference room at the Sandor Motor Inn on the main street so no one had trouble finding it. For some attendees it was just a matter of walking out of their room and across the path into the conference room. There was plenty of parking at the back of the Motor Inn for those in the Caravan Park, too. With a pleasant garden and pool to look out and enough space for our displays and to allow us to move around to talk to each other, it was an excellent meeting place.

A special presentation was made during the ALARAmeet, to Pat VK3OZ who has won the Florence McKenzie Trophy four times in the last five years – incidentally it is time someone gave her some competition – hint, hint! A photo of the presentation was included in the last AR but did you take note of the patchwork banner behind the scenes. Marilyn had made this to include photos of the groups of YLs from the earlier ALARAmeets to commemorate that ALARA was founded 30 years ago and this Meet was also celebrating 21 years of these gatherings, in the same city as the first one in 1984.

To cap off Pat's pleasure with the special presentation, hers was the number drawn out of the hat to take the banner home!

After official photographs etc we all piled into a bus which took us out to the Inland Botanical Gardens. This is a garden with a difference. There is an extensive rose garden; just coming into bloom which was set up immediately the land was assigned as a botanical garden. This gave the organisers something to show visitors, very quickly. However, the main focus of the volunteers who plan the gardens, is to have display areas with plants from all parts of Australia, to demonstrate what can and what cannot be grown in the Mildura area. I am sure this is an idea which could be copied by botanical gardens in other places. It must be very useful to the local gardeners.

One most interesting area we were shown was a bush chapel, with pulpit and pews all carved out of local timber. We were told that the church had been used for weddings already. On a good day (and Mildura has many more of those than most places) it would have been a lovely setting for memories.

On the Sunday we visited two wineries and a dried fruit complex, finishing the tour at an asparagus farm. I am sure we all found things to interest us in such a variety. I suspect most of us will be looking at the dried fruit and the asparagus in the supermarkets with new eyes because we had seen how these foods are prepared for market.

Unfortunately the official MEET had to end on Sunday afternoon when the ALARA banner was folded and handed to Bev VK6DE as Vice-president, for

transport to Tasmania where we will meet again in three years time.

We had been delighted to have Susan VK7LUV, the President of ALARA, with us for the Saturday but, due to family commitments, she had to fly out early on Sunday morning. She will be the co-ordinator for the next ALARAmeet.

Raija SM0HVN had travelled the furthest, from Sweden via Caboolture where she stayed with June VK4SJ for a few days before driving with her down to Mildura. They were planning to continue via Melbourne to Tasmania where they would tour for another week or so.

We had our New Zealand contingent, some regulars, others for the first time. We had Bev and Poppy VK6YF from the West; June, Val VK4VR and Ann VK4ANN from Queensland with Dot VK2DB to represent NSW with the rest of us from VK3 and VK5 (or should we make that VK-thrive?) It is great to be able to make new friends and renew old ones every three years. Amateur radio is a great hobby!

A special luncheon

At the ALARAmeet it was announced that there would be a special luncheon held in Melbourne to coincide with the presence in that city of some of the visitors. The VK3 girls used to hold regular luncheons but these have lapsed in the last year or so partly because of the difficulty of finding suitable venues when the one you have used for years closes down!

Rosemary ZL1RO, Marlene VK3WQ, Mavis VK3KS, and Lynette ZL1LL and the two OMs at the luncheon

June, Kathy VK3ZBA (standing), Christine VK5CTY, Muriel standing behind and Gwen VK3DYL

Raija and June were there before taking off for Tasmania. Rosemary ZL1RO, President of our sister organisation, WARO, and Lynette ZL1LL and their OMs, along with Christine from VK5 and five VK3s, Mavis VK3KS, Marlene VK3WQ, Gwen VK3DYL, Kathy VK3ZBA and Muriel May enjoyed a very pleasant couple of hours unwinding from a busy weekend.

Royal Show prizes – again!

Barbara VK3BYK with her lovely lingerie, took away three or four prizes. I am sure most people would be scared to wear the lovely garments for fear of damaging them, but they look just marvelous.

Maria VK5BMT entered some of her embroidery again and won prizes. I saw the really beautiful cross-stitched cubes hung as if on a Christmas tree, but I believe I missed her other entry. Sorry to say I also missed seeing the bobbin lace entry from Shirley VK5JSH, but others did see it. Congratulations all of you, you do lovely work.

Are you managing the estate of a 'Silent key'?

Please save any QSLs for the National QSL collection, but first contact:

The Hon. Curator,
Ken Matchett VK3TL
on (03) 9728 5350
or email: jeandawson@iinet.net.au

Rare DX, special call-signs prefixes and suffixes, pictorials and pre-war QSLs are needed.

Let us save something for the history of amateur radio.

Beyond our shores

David A. Pilley VK2AYD
Vk2ayd@wia.org.au

Again not too much to report on with happenings around the world so, for those lovers of CW, I thought the following may interest you.

High Speed Telegraphy (HST)

The following is from the IARU Region 3 Newsletter 3/2005. High Speed Telegraphy (HST) is an amateur radio activity with a more than 40-year history in Europe. It is a sport adapted to amateur radio, a real challenge for the lovers of Morse code (CW).

The sportsmen compete in three tests. The first test is reception and transmission of letter text, figure text and mixed text. The computer generates the reception texts, starting from an initial speed of 80 marks per minute and increasing the speed until everyone gives up. In the transmission test any kind of Morse key/keyer is allowed. The aim (both in reception and transmission) is reaching as high as possible speed with as few as possible errors.

The second test is reception of call signs generated by the computer (the so called RUFZ test). After any correctly received call sign the next one comes with higher speed, and the opposite - after any wrongly received call sign the next one comes with lower speed. The aim is to receive correctly as many as possible call signs within three minutes.

The third test is pile-up test (the so called PED test). The computer simulates a real HF contest with a typical noise as on the air, with numerous contestants calling you simultaneously and thus creating a strong QRM. The aim is to make as many as possible real QSOs within three minutes with correctly received and sent call signs of the correspondents and correctly exchanged RST reports.

To practice, the equipment needed is a computer and a Morse key/keyer. HST is very beneficial for self-education. Activity on the air is the best training but there are lots of software or interactive sites in the Web, especially designed for mastering the HST abilities.

The biggest events in HST are the World HST Championships, held in the odd years. Six World Championships are already in history showing an increasing number of participants from all three IARU Regions. It should be underlined that Japanese, Korean and Chinese societies have already participated in some of them. At the same time there are lots of CW clubs all over the world, including those in Region 2, that are not only possible participants in the future, but, furthermore, the abilities of their members can easily lead them to the winning position.

(This report was by Panayot LZ1US)

Africa

The cell phone rage

In just five years, the number of wireless users in Africa jumped from about 7 million to more than 76 million. This, as even remote villagers grasp for a technology that few outsiders thought they needed or wanted.

In spite of the obstacles faced in recharging handsets from scarce automotive batteries, the phones are being put to uses not even imagined by those erecting the networks. Inhabitants in two provinces are so eager for service that they have built 50 foot high tree houses to catch signals from distant cell sites. They climb them with their cell-phones in hand to use them from the lofty perch. More on this fascinating use of wireless is on line at http://tinyurl.co/at5vv (CGC)

(Now what's this about not making the local 2 m repeater?)

(Arnewsline 1467)

USA

Code or not to code

It was bound to happen! You can please some of the people some of the time, but there is always one out there.... When the FCC asked for comments on the proposal to drop the Morse requirement, it was asked

"What about a code licence. A CW license independent from all others? You could be anything from a Technician with code to an Extra without code and your frequency privileges would vary accordingly."

(Arnewsline)

UK

Antenna designer Gordon Bird G4ZU: SK

Antenna pioneer Gordon Bird G4ZU, has passed away. Well recognized for re-shaping the construction of antennas and their theory of operation, Bird passed away at Malves en Minervois in South France on August 16th.

During his career as a chief electronics engineer and manager he worked for the British Post and Telecommunications, NATO and the United Kingdom Ministry of Defense. His antenna designs include the "Bow-and-Arrow Yagi" the Minibeam and the famed "Birdcage" designs. A friend, Jean-Claude Menardn F8ND, reported Bird's passing. He was 86.

(GB2RS)

Europe

SSETI Express Competition

The European Space Agency (ESA) education department has announced an award to the radio amateur who submits the largest number of valid telemetry and payload packets from the student-built SSETI Express satellite. Telemetry may be received on any band to qualify for the award.

SSETI Express is scheduled for launch September 27 from Plesetsk in northern Russia. It will downlink telemetry and payload data in AX.25 format at 9k6 bps on 437.250 MHz and at 38k4 bps on 2401.835 MHz. The satellite later will also be available as a single-channel Amateur Radio FM transponder.

All radio amateurs interested in competing for this award are encouraged to download the necessary software from the SSETI Express Web site http://www.sseti.org/express and to use the SERACC system to forward the telemetry and payload data to SSETI Express Mission Control. Submissions will be automatically recorded, and the Web site will display a leader board.

The winner will be the amateur at the top of the leader board at 0000 UTC on January 1, 2006. The winner will be offered the opportunity to visit the Student Technology Education Conference and Exhibition next spring

in Germany. The three-day event is similar to the AMSAT-NA Symposium and the AMSAT-UK Colloquium. In addition, the winner will be invited to visit ESA's Mission Operations Centre (ESOC) near Darmstadt, Germany, for a private escorted tour of the facilities. ESOC currently controls many orbital and deep space missions and will be responsible for the European Columbus module when it joins the International Space Station.

The prize includes economy-class travel, accommodations and a modest daily subsistence allowance.

(ARRL)

UK

Space observations

A newly formed Amateur Radio group called SOAR – Space Observation with Amateur Radio – is aiming to get their balloons aloft in the U.K.. The group wants to use meteorological balloons to carry out amateur radio experiments to altitudes in excess of 90,000ft. It is hoped that through such projects it will help build bridges between the amateur radio fraternity and schools and colleges. They intend to launch payloads including cross-band repeaters, amateur television devices and automatic packet position reporting systems. If you are interested, check out their website at www.eham.org.uk.

(RSGB)

Spotlight on SWLing

Robin L. Harwood VK7RH

Instabilities and threats to SWL

Propagation is still quite unstable and there have been several major disturbances during this quarter. I do notice that frequencies above 17 MHz rarely propagate during daylight hours. This may improve slightly as summer rapidly approaches. One regular station, Radio New Zealand International, has not been heard on 15720 but this is not due to propagation as construction work is underway upgrading antennas in daylight hours. A second DRM-compatible transmitter should be operational in 2006. I presume that RNZI would be operational at weekends.

Radio Australia has apparently reintroduced news bulletins in French after some time. Also an Australian-produced English language teaching program called Radio Kangeru is heard over a shortwave relay of the main domestic RRI station from Jakarta. It has been heard on 9680 between 1005 and 1040 weekdays. A similar Indonesian language program from Australia has occasionally been heard over provincial stations for many years but this is the first foreign produced English language program I have heard over RRI and believe that the program may be compiled in Bali.

Elsewhere you may have read that Tasmania's main retail electricity supplier, Aurora, has commenced BPL trials in suburbs of Hobart and shortly here in Launceston. I personally am dreading the impact that this will have on my enjoyment of shortwave monitoring and future HF operations. I am pleased that southern hams were able to bring to the media's notice the interference implications to amateur and other HF users from BPL yet Aurora dismissed these valid concerns. Several weeks after the launch a new fibre-optic trial also was announced by the State Government in Hobart and Devonport. Again Aurora will be responsible for the operation and maintenance and I believe that the fibre-optic cable will come from boxes near the power lines. Why Aurora is investing in BPL when the rest of the world is ditching it is beyond me.

Zimbabwe is consistently being heard here on 6612. Originally thought to be a harmonic, there is continuing evidence that the usage of a channel within a non-broadcasting allocation is deliberate. I hear the station with modulation at a low level at 2000 and later at 0400 but it quickly fades out after the local sunrise.

Well that is all for this month. I sincerely hope that I will continue to listen on shortwave despite BPL being shortly trialled here in Launceston.

Making shunts for ammeters *continued*

$$1\text{ mm} = \frac{(1000\times0.1)}{6} = 16.7 \text{ rounded to } 17\text{ mm}$$

We need about 10 mm each end for terminating, so 10 x 37 mm wires are cut from the Cuprothal coil. In this instance, two bundles of five strands, each formed into a U, have been soldered to the circuit board foil to form the 10 A shunt, pictured in Photo 3. Note again how the connecting wires, which carry the main current, are soldered right at the shunt wire terminations.

Accuracy should be checked using the set-up shown in Fig. 3. For a typical 12 Vdc supply, resistance R will need to be about 1.2 ohms, suitably rated to dissipate 120 W for the time necessary to make the test.

**For each degree rise above a specified temperature of a conductor, each ohm of resistance of the conductor is increased by a constant amount called the "specific coefficient of resistance".*

For example, pure solid copper has a temperature coefficient of about +0.004 per degree C. That is, if a certain piece of copper wire has a resistance of 1 ohm at 0 degrees C, it will have a resistance of 1.004 ohms at 1 degree, and 1.4 ohms at 100 degrees C.

References and Further Reading

1. Test Equipment for the Radio Amateur, F. Smith, G4FZH, RSGB, pp6 ~ 9.
2. The ARRL Handbook for Radio Amateurs; see Ch 26 in any recent edition.
3. "How to Measure Large Direct Currents with Common Ammeters" D. Poeth II, K8TM, QST Jan '96 pp40 ~ 43.
4. "Rescaling and Customizing Meter Faces"; R. Lumachi,W2COM, QST, Mar. 2004, pp59 ~ 61.

VK4OQ,
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.
Email: john.bazley@bigpond.com

DXpedition to KH7, Kure Island: a milestone

Over the years DXpeditions have increased the facilities available, enabling more information to be exchanged between DX spots and amateurs trying to work them. Pilot stations were a great step forward, an idea originally suggested by John ON4UN. They have enabled areas of the world experiencing difficulties, usually due to marginal conditions, to make a QSO. Then we became accustomed to using 'on-line logs' to check that we were definitely in the log. Now with the DXA facility for the KH7 operation, the organisers have taken a giant leap forward.

For those who do not have Internet access – a brief description of DXA:

The DXA facility is an innovative web application that allows DXers to view the current status and activities of the DXpedition in near real time. Within a few minutes after making a contact, the DXer will be able to see confirmation entered in the expedition log. Information such as the callsigns logged in the last minute and in the last hour, the bands and modes currently being used by the DXpedition are displayed in a simple, automatically updated interface. The entire application runs within a standard browser – no software to be downloaded or installed (except a plug-in to play audio tracks).

When the KH7 operators log a QSO with you, they illuminate a green square in your table for the appropriate band and mode, confirming your entry in the log. Once you see the green square you can be absolutely certain that you have not worked a pirate. The map shows the most recently logged callsigns in their DXCC positions, as well as a set of ellipses that show the predicted propagation. Red ellipses are expected to have the highest signal strength, black the lowest. The callsigns shown recently logged are not correlated with these band propagation ellipses.

Also displayed is the time the DXpedition has been operating and how much longer they will be there, the number of QSOs logged and the time at your location and GMT.

With so many new facilities being introduced at the same time, there were bound to be teething troubles. Due to the high demand at certain times, some of the facilities have been disabled. To most of us the log and band activity were the main concern. It has taken a lot of hard work at Kure to get the definitive log onto DXA. To get some idea of their "problems" I quote from a news message dated 29th September.

"HOT NEWS! Our server has been up for one full day without crashing!

Current Time: Thursday 29th September 18:29 GMT

Server uptime: 1 day 1 hour 20 mins and 24 seconds

Total accesses 4,666,979". (Over 4 million. No wonder they had troubles!)

I am sure the planners of this facility knew they would meet problems, but did not realise the interest in the project and the number of amateurs who would access the programme. It is easy to criticise, but "nothing ventured – nothing gained" really does apply. What has been gained? A totally new concept of communication between DXpeditions and amateurs on amateur bands.The term "Green Squares" is going to take on a new meaning in the DX field! Rest assured the problems will be solved and variations of DXA are here to stay.

So what have we got to look forward to after all the activity from Kure Island?

St Pierre and Miquelon - AC8W, K8AQM, K8DD, K8GL, K8MM and W8IQ will be operating from there from 22nd to 28th November. They will also participate in the CQ WW DX CW Contest as FP/K8DD.

Sudan – Dane, S57CQ returned to Sudan in September and will be there for another year He will operate again using the call ST2T. QSL via S57DX.

ZD8 – Mike, G4LTI reports that Ian's (ZD8I) stay on Ascension Island has been extended until June 2008.

The Clipperton DX Club team (F2VX, F9DK, G0LMX and F5LMJ) that operated as A52FH in 2000 and A52CDX in 2004 will return to Bhutan from 18 November to 3 December 2005. They will be at the Ham centre in Thimphu on 18-29 November, and will also try to be active from Bumtang and the valley of Paro. It will not be a DXpedition but a project to promote the growth of amateur radio in Bhutan, and radio equipment will be donated in order to help establish new club stations in the east of the country. QSL via F9DK, direct or bureau.

K1NA, Jim, will be operating in the CQ WW CW DX Contest as PJ5NA from St. Maarten (NA-145). He'll be single-op in the all-band category. QSL direct only via K1NA.

N6TJ, will operate as 9Y4AA on all bands for CQWW CW in November.

NN1N, Dave; K9ZO, Ralph; and AG9A, Mark, plan to operate the CQ WW CW DX Contest with special call 5J1W from Colombia on November 26th and 27th. They'll be doing multi-single. QSL via NN1N.

Once again JE1JKL, Saty, will be QRV in the CQ World Wide CW Contest from Labuan Island (OC-133), East Malaysia as 9M6NA. He plans to be single-op 20 metre only. QSL via JE1JKL.

W6NRJ, Jim, plans to be on from the Bahamas with his friend N6KD in the first week of December. Activity will be on 12 through 80 metres

Potomac Valley Radio Club (PVRC) ops W3GG, Burt, and his nephew WD3I, Mark, plan to operate in the CQ WW CW DX Contest at the end of November from Israel. They will be multi-op as 4X0G. They will also be joined by nationals 4X6ZK, 4Z4DX and 4Z5KJ. Before and after the contest look for them to be QRV as 4X/W3GG and 4X/WD3I.

The Glorioso DXpedition expected between October and November with F5CW, Dany, and others, is still waiting for approval from the French government. Organizers feel they will be able to go in late November but will not get the permission until the last moment.

Thanks to the authors of The Daily DX (W3UR) - 425 Dx News (I1JQJ) and QTC DX PY2AA for information appearing in this month's DX News & Views. **ar**

Silent key

Donald (Don) Shand, VK3DZM

It is with a heavy heart that I commemorate the life of my good friend Don, VK3DZM, who passed away on 4th June while on his return trip from the United States and Britain where he had been visiting and staying with amateur radio friends.

Don, after many years of total dedication, had progressed from being a short wave listener, to gaining his novice licence and finally his full-call to end up being a very well liked and respected international figure in the area of 80 metres phone DX.

There is probably no better testimonial to Don's life in amateur radio than the emails received in response to the news of his passing. The following are a few brief snips:

Don was always a gentleman whose potent signal and friendly voice made dragging my rear end out of bed at sunrise a little more bearable. .... . sunrise on 75m will not be the same without him! Les, N1SV

Phil, W6UC, Fred, W6UA and myself spent the weekend with Don at Visilia, CA during the DX Convention. We had a great time and enjoyed meeting Don eyeball-to-eyeball. He was a fun spirited fellow and it was always a kick to chat with him on 75 meters. Bill - WA5VGI

Amongst the regular DXers on 80 in Europe the call sign VK3DZM was a very popular one. He always had such a strong signal due to his 4 square and also because he was always fair in sharing and helping other VK stations to work the DX with him. .....he did have a reputation amongst all the regulars on 80 as one of the band's finest gentlemen and also probably one of the most popular stations on the band....many stations have told me that Don was their first VK contact and that his call sign was just part of the 80 metre band. I know the band will never be the same again without him. Jon G0NVD

Don was born in Palmerston North, New Zealand in 1936. He initially worked on a dairy farm and while there he used to visit a neighbouring farmer who held an amateur radio licence. This was the starting point in Don's life long interest in amateur radio.

Don came to Australia on two occasions looking for work and finally found some in Melbourne. From there he courted Jan whom he had met in his home town of Palmerston North. The outcome of this was that he and Jan married and settled down on a property in Western Victoria at a little place called Langkoop. Don was a family man and he and Jan had three daughters and a son.

I first knew Don as a neighbouring farmer with whom I had a lot in common including an interest in farming, the raising of a family and playing social tennis together. In addition I learnt that Don was a keen short wave listener. When a TAFE class was run for the Novice Amateur Licence in nearby Naracoorte, Don became one of the enthusiastic attendees. The result was that Don gained his Novice certificate and took the call sign VK3NSD in 1979 and then, after a lot of hard work, Don passed his 10 wpm CW exam and the full theory to gain his Amateur Operator's Certificate of Proficiency in 1985. Following on from the TAFE classes the Naracoorte Amateur Radio Club was formed with Don as a very strong supporter.

While all of the above was going on Don was also busily helping raise their young family and in addition coping with a rural depression all of which could not have been done without the full support of Jan, a Massee Agricultural College graduate

Don was an avid supporter of the All Blacks rugby team of New Zealand. He enjoyed playing tennis with a group of locals called "The Rugged and Buggered" and hosted many evening games in the summer under lights at home. In more recent years he became very interested in watching old black and white movies.

At a community level Don was a base radio operator for the Apsley Group of the Country Fire Authority. He was also involved with local farmer groups, especially during the tougher times on the land. As a radio amateur he had been one of the instigators for extending the DX segment on 80 metres (75 metres).

Don had worked (but had not claimed) 296 confirmed countries using phone on 80 metres towards a DXCC award. This, incidentally, is a far harder goal to achieve in Australia than from the other side of the globe.

Don received the following awards that I know of: In 1989 the award for working all of the states of America (WAS). The ARRL International Contest Award for first place as a single operator, 80-metres phone for Australia in 1993, 2001 and 2003 with a fifth place in the world in 2001. The CQ World-Wide DX Contest for single operator 3.7 MHz SSB for Australia #1. The WIA VK-ZL Oceania DX Contest - first place for Australia in 1991 and 1992.

The link below has recordings of VK3DZM as heard in Salt Lake City, USA while working some of the locals from his home QTH. (There are three recordings).

http://www.smeter.net/slc/reception/examples.php

73 Don, VK3DZM, you will be sadly missed by all those who knew you.

George Stewart, VK5ALS

Plan ahead

The Central Coast Field Day 2006

19th February 2006

Healesville ARG

White Elephant

26 February 2006

Contests

Ian Godsil VK3JS
WIA National Contests Co-ordinator

Contest Calendar November 2005 – January 2006

Nov	12/13	Japan Intl. DX Contest	(SSB)
	12/13	Worked All Europe DX Contest	(RTTY)
	12/13	Spring Field Day	(VHF+)
	26/27	CQ WW DX Contest	(CW)
Dec.	3	RTTY Melee	(RTTY)
	10/11	ARRL 10 Metres Contest	(CW/SSB)
	17	OK DX RTTY Contest	(RTTY)
	26 (to 15 Jan 06)	Ross Hull Memorial VHF Contest	(VHF+)
Jan	7/8	ARRL RTTY Roundup	(RTTY)
	14/15	Summer VHF+ Field Day	(CW, SSB, FM)
	28/29	REF Contest	(CW)
	28/29	BARTG RTTY Sprint Contest	(RTTY)
	28/29	UBA DX Contest	(SSB)

Greetings to all readers

Over the last few months you will be aware that I have been trying to stimulate discussion about the use of logging programs in modern-day contests.

I take this opportunity to say thank you to several operators who took the trouble to express their thoughts, either via email or in conversation. I am also pleased to acknowledge that the chaps who responded are all active amateurs, not just those who have an occasional contact in some of our local contests, particularly the Remembrance Day Contest.

It is very easy for someone doing a task to think that others could be doing their part of the task the same way. I am assured by the above operators that there are plenty of people who use computers all week in their working situations and the last thing that they want to do is to be machine-bound in their shacks. They want to ENJOY their hobby when they can get to it.

Fair enough and I thank them again for this point of view. If, however, the inference is that the hobby of Amateur Radio can only be "enjoyed" if carried out in a non-keyboard environment, then there may be room for argument. However, I see their point, and I am sure that there will be readers amongst you who will agree.

Nevertheless, please do not overlook the fact that

(1) there are contests other than our VK events,

(2) these world-wide DX contests afford greater opportunities for testing and improving our abilities, capabilities and station performance than local contests can,

(3) most of the Managers of these events require logs in an electronic format – eg the Oceania DX Contest last month requires logs of more than 50 contacts to be in the Cabrillo format.

VK Contest Loggers

2005 I thought was a year of achievement in the development of logging programs for Australian contests, and this is partly my motivation in wanting to see them more widely used by VK hams. Much of this was fostered by Chris Edmondson VK4AA, the new Manager of the RD Contest, who set about encouraging people to develop a program for this year's event, even allowing for a few "curlies" in the revised scoring system.

That I heard many stations during the RD talking about their loggers was a tribute to John VK5DJ, whose program was posted on the WIA web site and obviously widely used. On behalf of all contestants, I thank John for his good work in getting this program modified in time from an earlier version. If you used John's program, please let him or the RD Manager know your thoughts about it – only this way can improvements be effected.

John's was not the only logger available for the RD. Mike VK3AVV has had a program for several years now and also managed to revise it to encompass this year's rule changes. I used this program and found only one insignificant "bug". Truly, there was no need to do any post-contest changes of any type, just print the log and send.

I commend Mike's VK Contest Logger to you all as an easy-to-use program for Windows platform. Also Mike has included areas in the logger for the VK/trans-Tasman Contest, ALARA and Oceania DX. This makes it a very versatile program for several Australian events. Mike assures me that it would not be difficult to add other modules when required.

Another VK ham who has done really good work in writing programs for some VK contests is Alan VK4SN. Alan has his own web site and on it you will find programs for the VK/trans-Tasman Contest and John Moyle Field Day. These are written for Windows, but they do require the user to have MS Access and XL (full version, not the cut-down version found in MS Works) as part of his Windows installation.

The program for the VK/trans-Tasman

Contest is a post-contest unit, but quite easy to use as long as you don't forget one or two little things in the bottom right-hand corner. These apply particularly to bonus points for distance and QRP.

The JMFD logger is quite intuitive, even if you are in a car. Here of course is where the laptop computer comes into its own.

Programs like these show that we have chaps in our home ranks who can develop things for modern AR usage. I urge you all to look at the above programs before next year's contests come around. I suppose it boils down to whether you may be interested in a mono- or multi-event layout. Whichever way you go, I urge you all to investigate using modern aids to logging and if you do decide to adopt them, PRACTISE, PRACTISE, PRACTISE BEFOREHAND!!! This cannot be stressed enough, as things happen in the excitement of contests that may just cause you to lose time and/or data if you are not completely careful.

Keep smiling and good contesting.

73, Ian Godsil VK3JS
WIA National Contests Co-ordinator

Results Dutch PACC Contest 2005

(VKs only)

VK2GWK	Single Operator	840 points
VK4TT	" "	592
VK6NU	" "	1728
VK6ERA	" "	1508
VK8AV	" "	2100

Results QRP Day 2005

From Ron Everingham VK4EV

VK2AVQ/QRP	46 points
VK3JS/QRP	38
VK2AWD/QRP	23
VK2GR/QRP	20
VK5BLS/QRP	14
VK2ZCM/QRP	9
VK4TGL/QRP	2

Rules: Ross Hull VHF Memorial Contest 2005 – 2006

From John Martin (VK3KWA),Contest Manager

The next Ross Hull Contest will run from December 26 to January 15. Logs will be due by February 6. The rules will be the same as for last year.

The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The name of each year's contest winner is engraved on the trophy, and other awards may be made in the various divisions of the contest. The contest is open to all amateurs.

Duration

0000 UTC Sunday December 26, 2005 to 2400 UTC Sunday January 15, 2006.

In Eastern Summer Time, that is 11 a.m. on December 26 to 11 a.m. on January 15.

Sections

A: VHF - UHF (50 MHz through to 1296 MHz), non-digital modes.

B: Microwaves (1296 MHz and above), non-digital modes.

C: Digital Modes, all bands.

Digital modes are defined as those in which the decoding of the received signal is done by a computer. Entrants may submit logs for one or more sections.

General Rules

One callsign and one operator per station. One contact per station per band per UTC day. Repeater, satellite and crossband contacts are not permitted. No contest activity is permitted below 50.150 MHz. In Sections A and B, entrants making contact on recognised DX calling frequencies should not occupy these frequencies for prolonged periods. All rulings of the contest manager will be accepted as final.

Valid Contacts

For Sections A and B, entrants must exchange RS (or RST) reports plus a serial number. Serial numbers need not be consecutive. For difficult propagation modes such as meteor scatter, exchange of callsigns plus two further digits is sufficient. For Section C, exchange of callsigns plus two further digits.

Scoring

Scoring will be based on the best 7 UTC days nominated by the entrant. Each contact will be scored as follows:

For 2 metres and above, one point per 100 km or part thereof (i.e. up to 99 km: 1 point, 100 - 199 km: 2 points, etc).

For 6 metres only, contacts below 1000 km: as above. Contacts from 1000 km to 2400 km, 2 points regardless of distance. Contacts over 2400 km, 20 points regardless of distance.

The band multipliers are:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Logs

Logs must cover the full contest period and contain the following for each contact:

- Date and UTC time.
- Station location (if operating portable).
- Frequency and callsign of station worked.
- Reports and serial numbers sent and received.
- Approximate location or grid locator of station worked.
- Estimated distance worked and points claimed, including the band multiplier.

Separate scoring columns for each band would be helpful.

Cover Sheet

Logs must be supplied with a cover sheet containing:

- Operator's callsign, name and address.
- Station location (if different from the postal address).
- Section(s) entered, and a list of the UTC days to be scored.
- A scoring table set out as the example below.
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can cross-check by adding the daily totals across the table, but please make sure that you include the separate band totals.

Date	6 m	2 m	70 cm	23 cm	etc
	---	---	---	---	---
Day 1	xxx	xxx	xxx	xxx	xxx
Day 2	xxx	xxx	xxx	xxx	xxx
etc.	-----	-----	-----	-----	-----
Total	xxx +	xxx +	xxx +	xxx +	xxx

= xxx (GRAND TOTAL)

A sample cover sheet and scoring table has been included in the postings on WIA web sites and the VK-VHF e-mail reflector. Copies can also be obtained from the e-mail address given below.

Penalties

Minor errors in distance estimates or calculations may be corrected and the score adjusted. Prolonged use of recognised DX calling frequencies (especially when the reports indicate strong signals) may incur a scoring penalty. Inclusion of any false log entries will lead to disqualification.

Entries

Paper logs may be posted to the Manager, Ross Hull Contest, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, Office 97 or Office 2000 RTF, DOC, XLS or MDB.

Logs must be received by Monday, February 6, 2006. Early logs would be appreciated.

Note on Calculating Distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. A more accurate method is to use six-digit Maidenhead locators and a program that can be obtained from the e-mail address given above.

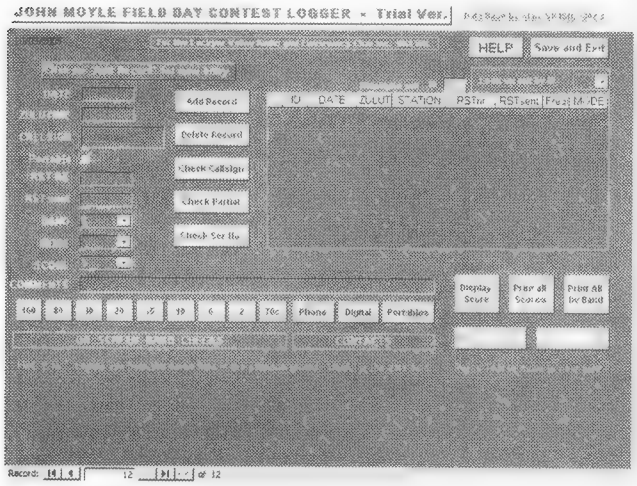

Fig. 1 Alan VK4SN's John Moyle FD logging page

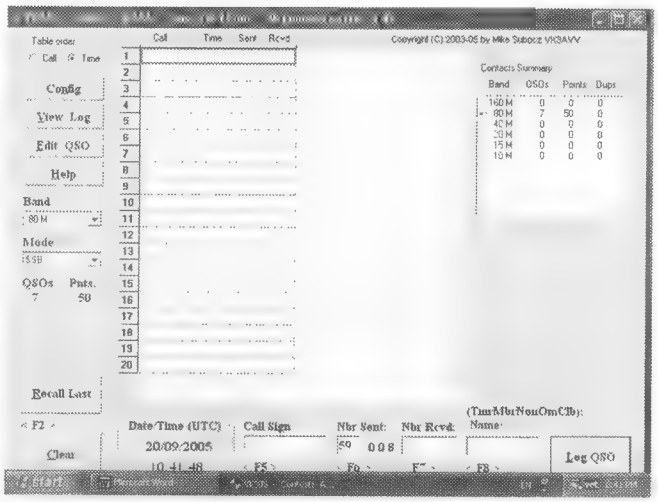

Fig. 2 Mike VK3AVV's logger page as set for ALARA Contest

AHARS SALE

Adelaide Hills Amateur Radio Society

November 19, 2005

Doors open to the public at 9 a.m.

Vendors to arrive at 7:30 a.m. to help set up.

VENUE: Westbourne Park Hall, Goodwood Road, Westbourne Park. SA

Book your table/s through Jim McLachlan, Phone 08 8294 2992. Cost is only $10 per table.

REFRESHMENTS: ALARA will be there as usual with their hot and cold drinks, pies and pasties and friendly smiles.

Remembrance Day Contest 2005 Preliminary Results

The results for the 2005 Remembrance Day Contest are finally to hand. The result is a very convincing win to Western Australia.

Although the Victorians really pulled their socks up this year, I rather fear the decision to award bonus points based on the distance of a contact has helped WA to win. HOWEVER, while the result would have been less decisive, the VK6s would still have won even without the bonus points!

The Western Australian victory is principally based on its extraordinary VHF/UHF performance, clearly the star performer in submitted logs.

That said, we have one member who is quite possibly a "machine". Victorian member Ray Cowling, in using his four callsigns to great effect, has scored what is quite possibly the highest number of points _ever_ accrued by a single individual in RD contest history. Ray's quite remarkable score was more than 4000 points. The nearest individual score was a mere quarter of that tally!

The delay in finalising the results has been of my own making, I'm afraid. The level of confusion caused by the distance bonus meant I needed to recalculate virtually _every_ log, with some of them taking a considerable time. I am of the belief that we should remove the distance bonus, but that other bonuses (for late night operation, for remote areas, for CW and less-used bands) should remain. I would also like to introduce a points bonus for all contacts with Foundation Licensees in 2006.

Here are the final scores:

AREA	SCORE	RANK
VK6	973.37	1
VK3	527.23	2
VK5	200.19	3
VK7	151.86	4
VK4	79.806	5
VK1	45.269	6
VK2	37.645	7
VK8	2.0316	8

Details of all scores in December AR

Chris Edmondson, VK4AA / VK3CE
PO Box 123,
Eagle Heights,
Queensland 4271
07 5545 0666 phone
07 5545 3456 fax
0417 35 3599 mobile

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Amateur Radio

NEEDS ARTICLES

Address for submission on page 1

VHF/UHF – an expanding world

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@wia.org.au

Weak signal

David Smith - VK3HZ

The auroral activity reported in last month's column continued in early September. Jim VK3II at Coronet Bay reports: *"There were some very strong auroral signals on 2 m last Sunday 11 September from approx. 1615 - 1745 hrs local time. Quite a few Melbourne stations around and some were aurora-affected at this QTH. Stations heard and worked here on SSB included VK1ZQR, VK2GKA, VK2KRR, VK3ZQB, VK3DUT, VK5DK, VK5ZLX and VK7JG. Approximately 500 Hz positive offset was noticed on aurora-affected stations. TV channel 5A audio on 143.776 MHz from Newcastle was coming in around S5 during most of this. No stations north of VK2GKA were heard at this QTH. The 144.1 MHz calling freq. was very busy, most contacts taking place on the calling freq."*

VK4 Activity

There have been some unusual propagation conditions along the Queensland coast generating quite a bit of activity. Doug VK4OE provided the following extensive report: *"From what I have been able to determine, awareness of this opening commenced on the morning of 16 September when VK4KK in Emu Park just South of Yeppoon worked VK4FNQ in Charters Towers on 2 m SSB. For the next two weeks and more, the two had regular QSOs, always in the morning in the 6 am to 7 am time slot. John VK4FNQ was, of course, alert to the possibility of working stations further south and on 28th September he completed QSOs with several Brisbane stations including VK4AFL, VK4ZQ, VK4AML and VK4OE. It was most interesting to observe that propagation favoured different Brisbane stations at different times. These distances are around 570 km and the path is entirely over land.*

This propagation was due to a ridge of high pressure that, with a bit of waxing and waning, had stabilised itself along the Queensland coastline. Various BOM charts illustrate this and the Hepburn prediction charts clearly indicate that excellent conditions were present.

Through all this, John VK4FNQ was having frequent 2 m contacts with Russell VK4BEG and Keith VK4BKS in Malanda on the Atherton Tableland (inland from Cairns, altitude 750 metres). South Queensland stations became aware that there was a real possibility of also working them and this first occurred to VK4KK early on 20th September, a distance of close to 840 km.

Other stations involved were VK4TWR and VK4JOO in Gladstone, VK4AJS in Rockhampton, VK4BLK in Yeppoon and VK4TZL in Hervey Bay and they continue to be active in the weak signal arena.

The ridge of high pressure stayed in place for many days and every morning was a voyage of discovery as to which stations may be able to be worked. On 1st October the propagation between Central and North Queensland extended itself enough to include Brisbane. VK4AFL and VK4AML successfully completed contacts around 2030Z with VK4BEG on 2 metres, a distance of 1384 km to VK4AFL.

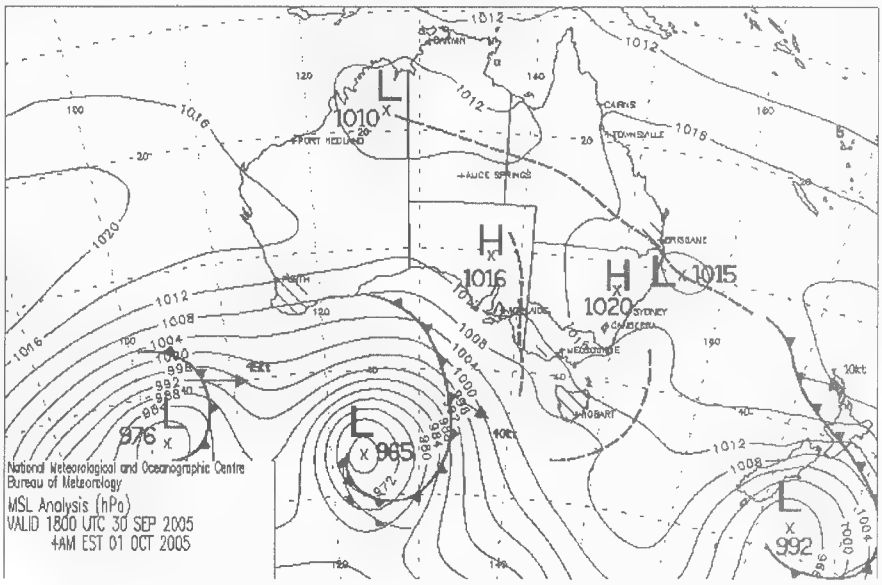
From Hervey Bay, Glenn VK4TZL's experience was that propagation really picked up to the north over the days 5th to 9th October. Frequent QSOs took place with the northern stations and there were times when stations 240 km away in Gladstone were swapping "30 dB over" reports with him, and this was off the back of each other's beams! The "contact of the month" for him was with VK4BEG on 70 cm at 2039Z on 7th October, a distance of 1160 km.

Also on 5th October, VK4ZQ (Brisbane) successfully contacted VK4BKS (Malanda) and with VK4WDM in Townsville on the 7th.

The ridge of high pressure eventually moved east and, as often happens with extensive inversions that don't dissipate quickly, it began affecting other propagation paths. Central Queensland stations became able to trigger an FM repeater ("triggerable beacon!") in New Caledonia with Brisbane stations Wayne VK4WS and Roy VK4ZQ reporting working Patrice FK8HA on 7th October through it.

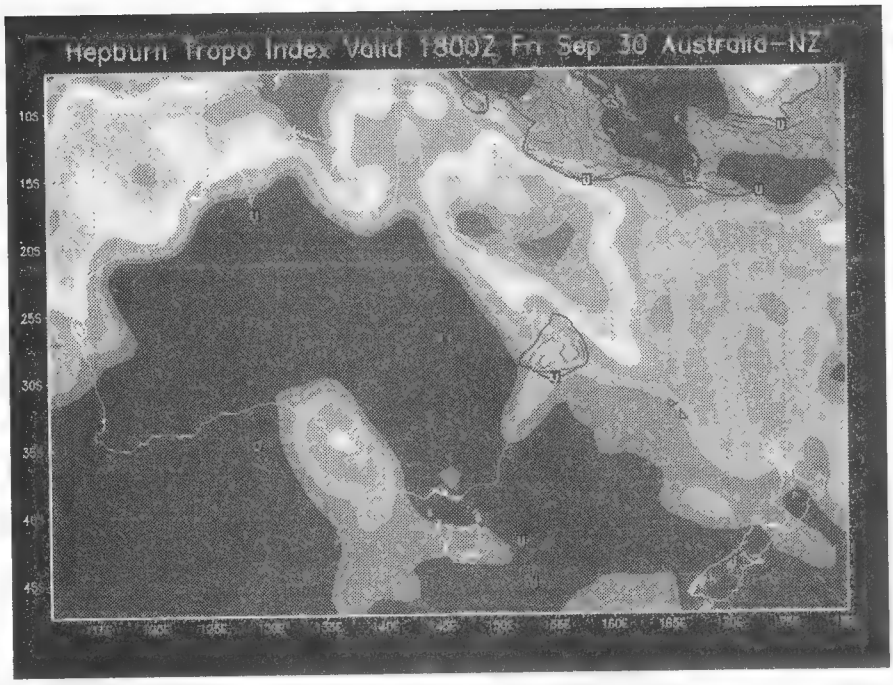
Through all this excitement, propagation from Brisbane to the south remained poor, again as was being predicted by the Hepburn charts.

It must be said that things like this have happened before, even on FM from Brisbane to Cairns but they have not been so dramatic or for such a length of time. Col VK4ACG is able to describe several times during his years of living



at Thursday Island (right at the tip of Cape York) that repeaters and stations not far short of Brisbane could be heard. He believes that extension even to ZL from there has occurred!

It has been the presence of active VHF/UHF operators in various places along the Queensland coast that has led to us knowing that it was actually happening. Let's all keep our awareness of potential long distance propagation alive by being active, calling instead of just listening, optimising station performance, and keeping in touch with each other. It takes two stations to make a contact!"



Mobile – with a difference

Chris VK2DO has recently been experimenting with mobile operations and aircraft-enhanced propagation on 2 m. From his home station, Chris is normally an S9+ signal into Melbourne when the aircraft are in the right place. However, he normally needs to be well on the way to work by the time the path peaks – usually around 0845 local time. So, he has mounted a trusty IC706 in his car and has been experimenting with various antennae. Initial tests with a vertical whip were disappointing and a horizontal halo, although of the correct polarisation, was also unimpressive due to its pickup of surrounding noise. So Chris now has a 4-element NBS yagi mounted to the fibreglass roof of his twin-cab Ute. The yagi is permanently pointed "left" in the direction of Melbourne for his northwesterly run into work. Using this setup, Chris has worked many distant stations including VK3's II, DUT, KEG, BJM, HZ and AFW. Even off the back of the beam, he has worked VK2's TG, GKA, APP and EMA. All this goes to show that you don't need 4 yagis and 400 watts to work long distances. If you pick your times, a modest setup can give quite impressive results.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rex Moncur – VK7MO

I have been somewhat out of the local scene while undertaking a one-man digital EME DXpedition to the Cocos-Keeling Islands, VK9C, and Christmas Island, VK9X, in the Indian Ocean. For me this was a most memorable experience with 155 EME contacts on two metres and eight on 70 cm. All from a small portable station that was carried as personal luggage on aircraft. The smallest station worked on 2 metres was Joe, VK7JG, who uses a single 3 el yagi without elevation. The 70 cm operation was a bonus using only a IC-910-H barefoot with 65 watts to an antenna. The 432 MHz antenna was an ad-hoc construction using insulation tape to stick elements to a squid pole left at Cocos-Keeling Islands by Bernd, VK2IA, and to an element of a 20 metre beam left by David VK2CZ at Christmas Island. One tropo contact was made from Christmas Island to Ron VK6KDD, in Port Hedland over 1767 km using JT65.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

September has again been very quiet month on 6 m with very few reports of contacts.

Wayne VK4WS Brisbane worked Patrice FK8HA on the 9th September and Gary VK4ABW Townsville reports an opening to the JA1 area on the 25th September.

John VK4FNQ Charters Tower forwarded the following from his log:

30 Aug 2005	0448	50.110	VK5UBC	Heard 41
	0504	50.110	VK4BLK	Heard 519
	0516	50.110	VK5ZSA	Heard 41
3 Sep 2005	0456	50.079.00	FK8SIX	Beacon 529
4 Sep 2005	1045	50.046.30	VK8RAS	Beacon 529
7 Sep 2005	0225	50.046.30	VK8RAS	Beacon 559
	0300	50.046.30	VK8RAS	Beacon 519
		50.287.70	VK2RHV	Beacon 529
13 Sep 2005	0150	50.287.70	VK2RHV	Beacon 519
	0215	50.287.70	VK2RHV	Beacon 519
	0300	50.079.00	FK8SIX	Beacon 519
14 Sep 2005	0935	50.287.70	VK2RHV	Beacon 419
15 Sep 2005	2038	50.110	SOLAR BURST	
21 Sep 2005	0020	50.287.70	VK2RHV	Beacon 41

Have a look at this site - http://www.hb9six.org/ - to view the highest 6 m beacon in the world, recently heard in Canada.

Hopefully conditions will improve in October and early signs are good with openings already occurring on 3rd and 4th October from VK5 to VK1, 2, 4 and 6. More details next month.

Please remember to send any 6 m information to Brian VK5UBC at bcleland@picknowl.com.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

Conditions were fairly ordinary during September for Australian operators, though toward the end of the month, conditions did pick up in VK4.

Tropo duct openings reported for September occurred in VK4 on – 5th, 14th, 15th, 21st, 28th, 29th and 30th, and in the south east of VK on – 5th, 6th, 7th and 20th.

Mike VK4MIK worked to VK4RDC Hayman Is, 451 km; VK4RHR Hodgson Range, 640 km. Felix VK4FUQ made trips also to those repeaters and Mackay.

John VK5PO worked Leigh VK2KRR on simplex, 738 km. Brian VK5UBC portable southern Yorke Peninsula worked to Mt Macedon, Ararat, Warrnambool, Ballarat, Grampians, Bordertown, Naracoorte and Mt Gambier.

Start of October has seen some nice long contacts in Queensland, but more on this next month.

Long Distance Competition

The 05/06 Long Distance Competition has been running for 3 months now and there has been some interesting action for those following the progress.

It was suggested that a 50 MHz category be included, this has now been implemented, though no contacts submitted at this stage.

In the 144 MHz category, most contacts logged at this stage are for inland tropo between VK2 and VK5. Furthest distance being a contact between VK5UBC and VK2KRR at 914 km between Corny Point and The Rock. Some tussles in the EME area between VK4CDI and VK2KRR.

On a state level, the VK5 area should see some interesting loggings in the next few months with VK5UBC and VK5PO trading places a number of times already.

432 MHz and 1296 MHz are the only other bands with contacts submitted. The higher up frequencies have been quiet at this stage.

Only VK5UBC and VK2KRR submitted logs for 432 MHz. Again inland tropo being the category. A good bout of 70 cm conditions will see some good movement here.

Onto the FM DX categories and we're seeing some great action on a national level but fairly one sided on a state by state basis.

On the 146 MHz FM national level, distance records originally held by VK5PO and VK2KRR for FM simplex (FMS) and FM repeater (FMR) contacts has recently been smashed by contacts logged by Mike VK4MIK and Mike VK4JOO. The two Mikes currently are joint holders of FMS#1 of 923 km and VK4MIK holds FMR#1 of 951 km. This tops the previous records by around 200 km.

On a state level, we see a great effort by Hayden VK7HAY, whose portable efforts have netted him top 3 spots in the VK7 division and just missed out on a national listing.

Low activity levels prevail in the 438 MHz FM section with only 2 FMR contacts logged. FMR#1 is VK5UBC with 308 km and FMR#2 is VK4MIK with 244 km.

Good luck to all.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ar

Over to you

Boring? Hardly

I am writing in response to the column entitled "Are we boring you?" which appeared in the Editorial Comment section of AR Volume 73 No 10, October 2005.

As a new amateur (so new in fact that I'm still waiting for the licence certificate) I would like to say that far from finding rare DX, QSL card collecting, ridiculous pointless contests and Morse code boring that in fact I find these all to be very interesting core elements of the hobby.

Rare DX is the exciting challenge ahead, QSL cards are a fun way of documenting achievement in meeting the DX challenge, Contests should be neither ridiculous nor pointless when they serve to hone on-air operational skills, fine tune equipment and/or station set-up and as for Morse, that highly contentious mode, it may come as a surprise to some that this new amateur is extremely keen to become proficient in this mode. Because, even with my limited experience, it seems obvious that when band conditions are awful and the only equipment you have access to is something you knocked together in the garage then Morse will work like nothing else will.

Now these are just some of *my* interests and no two people will be identical in this regard. The strength of amateur radio is the fantastic array of different but related technologies, modes and activities that can be explored and the diversity of people that this brings together.

Just so those who are interested can pigeonhole my demographic I'll be 39 years old this October, which makes me older than some and lot younger than others! But I don't feel that my interests are necessarily unique to my age group and above (or below). Reading posts to Ron Bertrand's (VK2DQ/4), "Radio & Electronics School" bulletin board from both past and current fellow students shows an active interest in most if not all of the above, and yes that includes Morse! This interest is coming from many who I judge to be much younger than myself, by virtue of still being at high school or university.

So do I find it boring? Hardly!

Viva La Amateur Radio!

73 Steve VK2HHP

PS. I'd also be very interested in any article someone cares to write on 2.4 GHz digital data networks. Just because I still find the above interesting does not mean I find the newer technologies less so.

ar

The WIA President addressed the new amateur licence structure and the WIA assessment system, particularly in relation to the Foundation licence. He stressed that everyone was still learning and testing the protocols that had been developed and these were being modified in the light of experience.

Michael said that he knew that a number of clubs needed more WIA Assessors qualified and had asked when further assessor training courses would be conducted. The WIA would certainly conduct a further assessor course in the reasonably near future, though he did not know when and where the course would take place. "I ask all WIA affiliated clubs, who wish to nominate people for qualification as WIA Assessors to complete the forms and send them to the WIA national office, so we can evaluate the best way of meeting this need."

First BPL interference complaint submitted by a Tasmanian amateur.

The Aurora BPL trial has been activated in Mt Nelson, a suburb of Hobart currently without competitive broadband assess.

Conrad, VK7HCK, has lived in the area with his family for a few years and is an active HF operator. Conrad is experiencing over S9 interference levels on HF bands with the highest interference level (S9 + 40dB) on 80 metres. The level of BPL interference has effectively prevented Conrad from operating on HF.

On his own initiative, Conrad has lodged an interference complaint with ACMA and also with Aurora Energy and is waiting to see what action they will take to remove the interference.

WIA Amateur Radio Bookshop open for business

The WIA Amateur Radio Bookshop is now open for business. A Catalogue (V 1.10) is available and entry is via the bookshop tab on the left hand column on the home page of the WIA website.

Those who order the 2006 ARRL Radio Communications Handbook will receive a beautifully reprinted copy of the 1926 ARRL Handbook free!

The range is small as this represents the current inventory. More titles will be available in the coming months. It is hoped that the WIA Amateur Radio bookshop will be carrying RSGB titles soon.

Podcasting a great success for the WIA National News

Recently Grant, VK3HFS, announced that the VK1WIA National News was available as a podcast download each week.

Server statistics show that in excess of 150 people per week are now getting the news as a podcast! In addition last week some 552 people received the news from the mp3 files.

VK4SS makes generous donation

Al Shawsmith, VK4SS, one of the original Australian radio amateurs, and one of amateur radio's greats, now 90 years old, presented the WIA with a cheque for $10,000 on Saturday, 22 October 2005.

WIA President, Michael Owen, VK3KI, accepted the cheque on behalf of the WIA, saying that he was accepting it on the basis that Al's wish that the money would be used for educational purposes or in support of WIA educational activities would be fully respected.

Michael thanked Al on behalf of all radio amateurs, saying that he was deeply moved by this thoughtful and generous gesture.

ar

St George ARC Auction

The *St George Amateur Radio Society* is having an

Auction

at the club's premises:
First Kyle Bay Scouts Hall,
Donnelly Park, Kyle Parade,
Connell's Point, NSW 2221.

on

19th November 2005
at 10.30am.

Enquiries: Brian, VK2GCE
President, St George ARS.
brianclarke01@optusnet.com.au

My even further experiences with DSB QRP

Graeme Wilson VK6BSL

I moved to Perth in 1989 and have taken my homebrew DSB QRP rig (about which I wrote two articles for the New Zealand Magazine Break In) when going back to New Zealand for a couple of trips. I have used the little rig continuously since then, and here is an update.

The rig is in three basic parts and was initially built in 1988 (I won the Single Operator Division of the NZART National Field Day contest running two watts that year). The rig also won the homebrew competition at the 2002 Hamfest..

The VFO is a circuit from page 36 of the ARRL publication Solid State Design. It is extremely stable and is separately boxed.

The receiver is the Break In "Alivo" designed by Fred Johnson ZL2AMJ using an NE602, then a BC549, then an LM386. It can hear most of what my Kenwood TS140 hears but is quieter!

In the same box is the mike amplifier from page 202 of Solid State Design. The mixer and RF amplifier are from ZL2BMI using a BC549 then a BD139.

The small 4/5 watt linear (Drew Diamond design) is in the third box with a SWR metering circuit. Most of the circuits were on PCBs to my design as in *Amateur Radio*, July 1999, page 47.

With an 80 metre dipole never more than six metres high, fed with 300 ohm ribbon, I have worked all of New Zealand when there. From Perth I have worked VK 2, 3, 4, 5, and 7 and it is in use most Sundays on the WIA broadcast with excellent reports of clarity and stability.

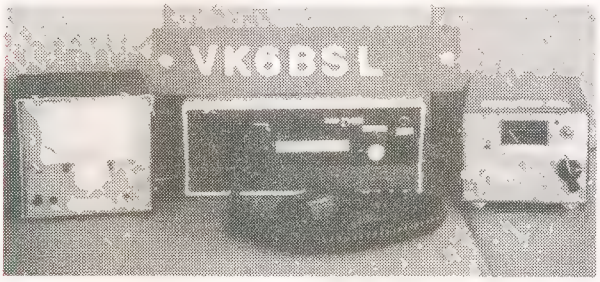


Photo 1 – From left to right, the VFO, the DSB transceiver, and the linear and SWR metering.

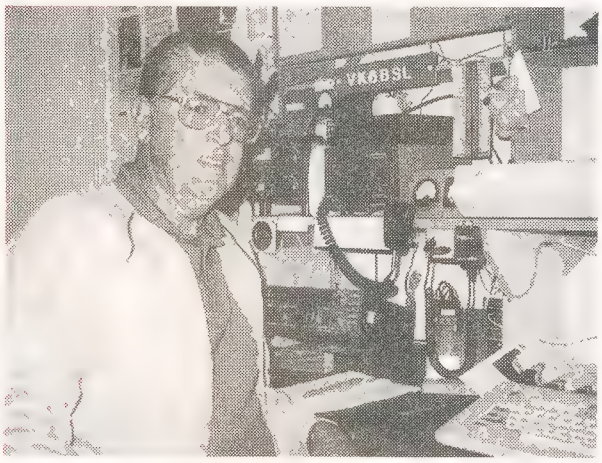


Photo 2 – Graeme VK6BSL in his 'shack'.

By the way, thanks to all the operators who stretch their ears and work me, particularly when conditions aren't good for QRV. I have rarely -worked any other "home-brew" rigs in the past, 20 to 30 years. Shame, shame. (Keep up the good work, though, Drew!)

I am pleased that I can repair this rig if it develops a fault, although that very rarely happens. In August 2003 I completed a 40 metre copy but all in the same cabinet and with RIT. This goes very well and was "highly commended" at last years Hamfest.

ar

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Tri band IIB 35 C 10/15/20 m	$745
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Rotable dipole 40 m	$250
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AMSAT

Bill Magnusson VK3JT

Disappointment for the SSETI team

In late September we received the disappointing news that the launch of SSETI had been delayed. The delay was caused by one of the spacecraft on the launch, "SINAH", having suffered a significant failure and not being ready to fly. Early indications suggest that the launch would be delayed for at least one month. Then early in October Graham Shirville G3VZV announced that the launch had been re-scheduled for Thursday 27th October from the Plesetsk Cosmodrome - with 28th October as a back-up date. The launch time is still expected to remain at 06:52:26 UTC. Let's hope that by the time you read this we have SSETI up and running. A google search for "SSETI" will lead you to the web site and the latest information regarding the state of the launch campaign, frequencies, etc.

Some thoughts on satellite ranging experiments

It's been said that amateur radio satellites offer something for everyone. You may simply be interested in chatting or hunting new states or countries or collecting "grid-squares". Telemetry demodulating, decoding and display may grab your interest, or maybe APRS positioning. Perhaps the technical challenge of doing it all on a limited budget appeals to you.

One unusual topic has been under discussion on the AMSAT-NA bulletin board recently. "Satellite Ranging". Although this activity has been the province of control stations for ages the advent of global positioning (GPS) satellites and the ability to link them to APRS on some satellites has brought it into sharper focus for the average user. In its simplest form you send out a short duration pulse from your transmitter and receive the re-transmitted pulse via the satellite's transponder. By accurately recording the time difference between the two pulses either in software or on an oscilloscope a remarkably good estimate of the range (distance between you and the satellite) can be made. By watching the changes in the value of the range it is even possible to establish a crude set of "keps" for the satellite - if you have the appropriate software. As usual the "gurus" are watching the BB discussions and James Miller bowed in with this response.

"Yes. All Amsat P3 satellites had/have ranging capabilities. Either the flight computer could regenerate and return a 400 bps signal, or a transponder could return anything. The resultant range measurements were used to determine the satellite's orbit, and will do so again for P3E. When AO-40 was working you could send pulses through the transponder, and watch the changing delay. Pulse-at-a-time measurements are of course noisy, and you can do far better by sending a rapid stream of pulses. These can be faster than the round-trip time allows if you make the pulses a unique stream of +pulses and -pulses, which manifests itself as a quasi-random data stream. With this you can, with suitable mix of hardware and software, get both uplink pulses and downlink pulses "into" a computer and do all the time to range conversion automatically to remarkable accuracy (sub km)".

An article about this is at: http://www.amsat.org/amsat/articles/g3ruh/123.html.

So there you are – another interesting facet of amateur radio satellite activity for your consideration.

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

New South African Satellite

South Africa, in collaboration with other African Nations is to build a network of LEO satellites. AMSAT-South Africa has been involved in discussions with the Department of Science and Technology to include an amateur payload to serve the needs of Amateurs on the African continent. *"Now that the announcement has been made we will intensify our discussions with the various role-players"*, President, Hans van de Groenendaal ZS6AKV said. He added, *"At this time I call on radio amateurs to send in ideas of what payload they believe will serve the African Amateur Radio Community best"*.

The full story can be seen at: http://www.southgatearc.org/news/october2005/sa_satellite.htm.

It's obvious from the above that the satellite will be designed with South African amateurs in mind but whether this means it will only be switched on over South Africa is not clearly indicated, even on the web site. We'll have to wait for more information on this one. If it's part of a large constellation of satellites then maybe it will have to observe general power budget constraints across the whole constellation, which could put it out of action for much of each orbit in similar fashion to AO-27. Time will tell.

Deployment of "Suitsat" draws nearer

As the time for deployment of Suitsat comes closer (December 2005) it would do well to look at the history of this project. Here is a summary from the AMSAT archives.

On Thursday September 8 at 13:08 UTC, Progress 19P lifted off from the Baikonur Cosmodrome in Kazakhstan. Included in the 2.5 tons of fuel, food and supplies are two Amateur Radio on the International Space Station (ARISS) systems – the Suitsat amateur radio hardware and the Slow Scan Television (SSTV) hardware and software.

The successful docking of Progress to ISS on September 10 culminates the successful design, development, certification and delivery of these two ARISS Projects. The ISS Expedition 11 crew will unpack this equipment, making it available for installation, use and deployment by the Expedition 12 crew.

The Suitsat amateur radio system, coupled with a school artwork project, is planned to be installed in an outdated Russian Orlon spacesuit. It will then be deployed from the ISS during an Extra Vehicular Activity (EVA, or spacewalk). This is expected to occur in the December timeframe by the Expedition 12 crew.

The Suitsat amateur radio system will beam down special messages and an SSTV image from within the Orlon space suit as it floats in space. Suitsat radio system will allow hams and students to track the suit and decode special international messages, space suit telemetry, and a pre-programmed Slow Scan TV image through its specially-built digital voice messaging system and amateur radio transmitter. As built, Suitsat will be a transmit-only capability that will run on the space suit's battery power.

As part of the Suitsat project, a CD with hundreds of school pictures, artwork, poems, and student signatures is included. Two identical CDs were flown, one will go in the suit and the other will be for the crew to review.

Using the crew CD, we hope to downlink these images using the SSTV system that will be located inside the Service Module once it is operational. There are approximately 300 items on the CD. These are from all over the world (Japan/Asia, Europe, Russia, Canada, US, South America and Africa).

Several NASA Explorer Schools participated as well as numerous ESA and Russian Space Agency-sponsored schools. The idea for Suitsat was first conceived by the ARISS-Russia team, led by Sergey Samburov, RV3DR, and was extensively discussed at the joint AMSAT Symposium/ARISS International Partner meeting in October 2004.

The project, also called Radioskaf or Radio Sputnik in Russia, is being led by project manager A. P. Alexandrov and Deputy Project Manager A. Poleshuk from RSC Energia, located in Korolev (Moscow area) Russia. On the US side, the hardware project development was led by AMSAT member Lou McFadin, W5DID.

Since October 2004 the Suitsat design concept matured and evolved due to the challenging development time constraints. In a very short timeframe, the ARISS international team designed built and tested a simple, yet fully featured system that we hope will inspire hams and students around the world.

The SSTV system will be installed inside the Service module as an integral part of the ARISS ham radio system. It will transmit and receive (JPG) still images from the International Space Station in a format called Slow Scan TV (SSTV).

When fully operational, the SSTV system is capable of sending up to 480 images per day from ISS. It will also be able to receive images from amateur radio stations on Earth. This system will utilise the already installed Kenwood D-700 radio and the ARISS antennas mounted on the Service Module.

The SSTV equipment flown on Progress 19P includes the SpaceCam software, a radio/computer interface module, and data cables. The dedicated laptop for SSTV operations will be launched on a subsequent Progress vehicle.

Over the course of the past several months, the Suitsat and SSTV system passed the stringent NASA and Energia safety certification process and were deemed ready for flight, clearing the way for the incorporation into the Progress 19P vehicle.

More information on SSTV and Suitsat will be provided as we get closer to installation and deployment. The above information was provided for the AMSAT-NA web site by Frank H. Bauer, KA3HDO ARISS International Chairman.

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HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

November 2005
T index: 21

Legend

Frequency scale: UD, E-MUF, OWF, F-MUF, ALF, >10%, >50%, >90%

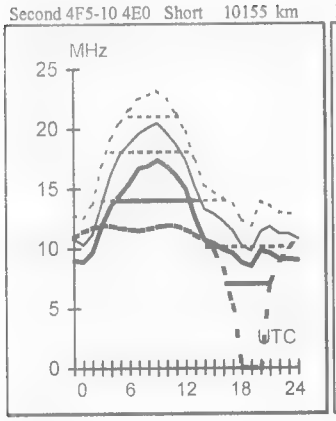
Time Scale

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

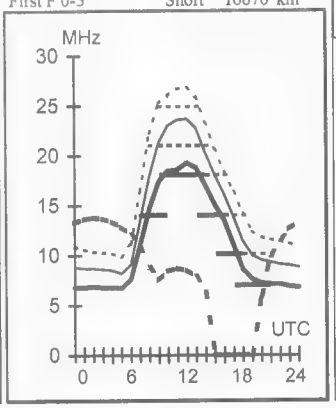
- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

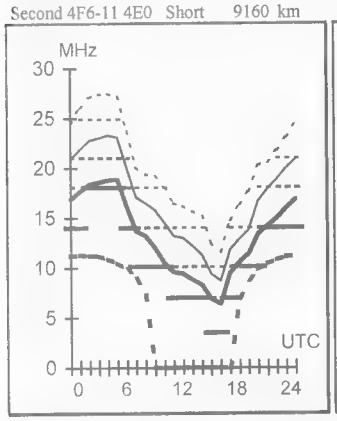
Adelaide-Capetown 226
Second 4F5-10 4E0 Short 10155 km



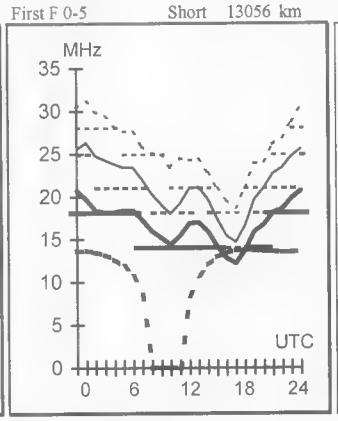
Brisbane-Dublin 335
First F 0-5 Short 16670 km



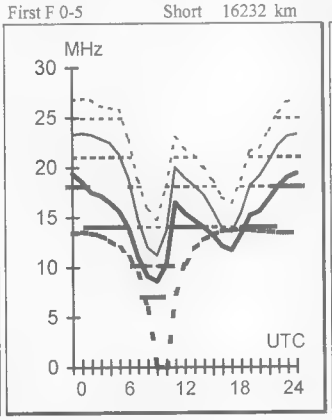
Adelaide-Honolulu 57
Second 4F6-11 4E0 Short 9160 km



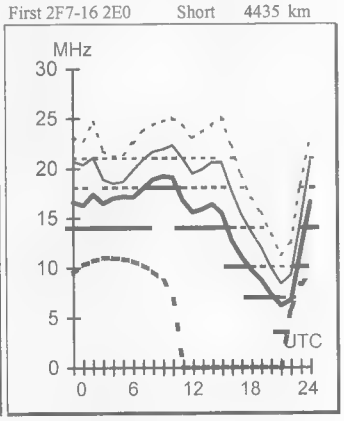
Brisbane-Lima 122
First F 0-5 Short 13056 km



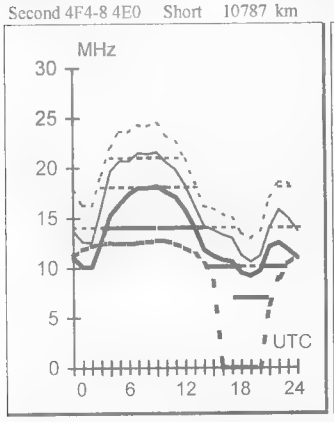
Canberra-Barbados 123
First F 0-5 Short 16232 km



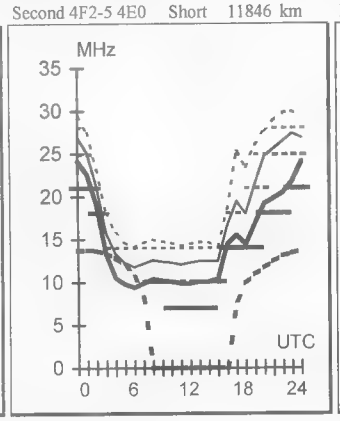
Darwin-Bangkok 310
First 2F7-16 2E0 Short 4435 km



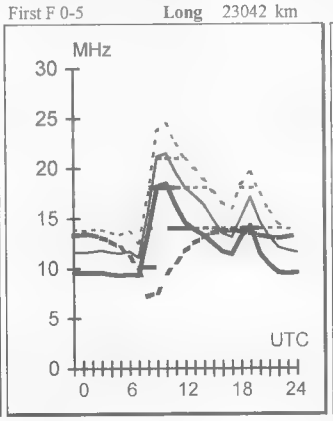
Adelaide-Lusaka 246
Second 4F4-8 4E0 Short 10787 km



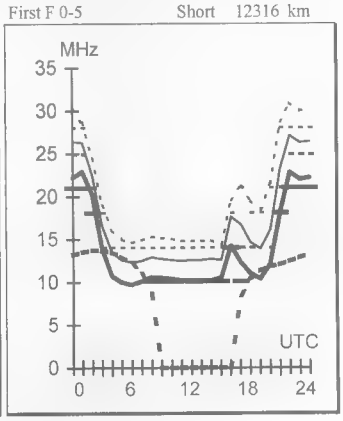
Brisbane-Seattle 44
Second 4F2-5 4E0 Short 11846 km



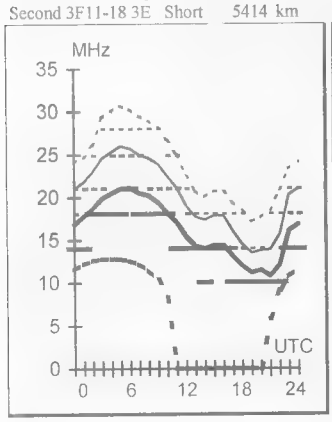
Canberra-London 136
First F 0-5 Long 23042 km



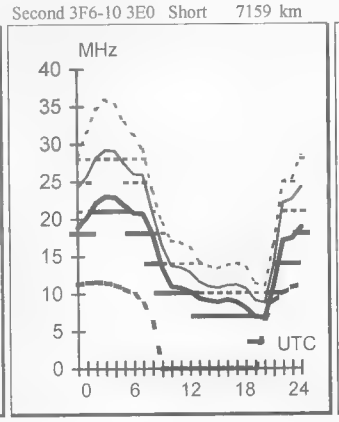
Darwin-San Francisco 54
First F 0-5 Short 12316 km



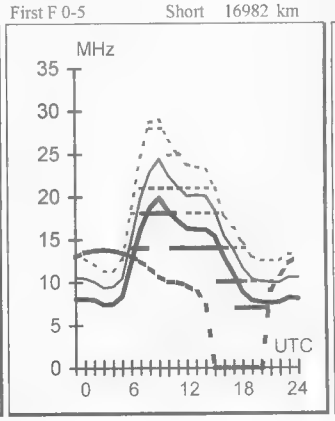
Adelaide-Singapore 311
Second 3F11-18 3E Short 5414 km



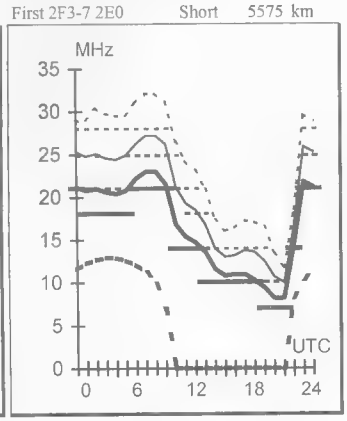
Brisbane-Tokyo 348
Second 3F6-10 3E0 Short 7159 km



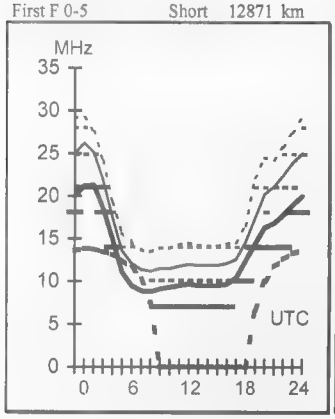
Canberra-London 318
First F 0-5 Short 16982 km



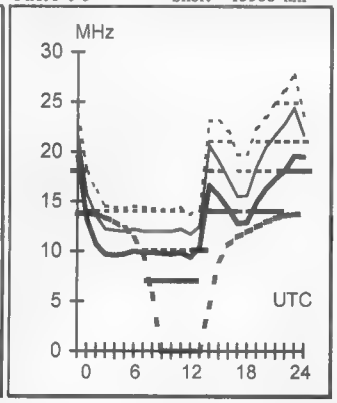
Darwin-Seoul 356
First 2F3-7 2E0 Short 5575 km



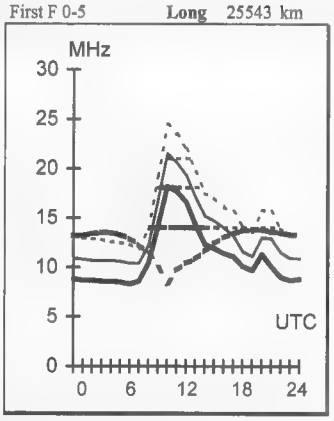
Hobart-Anchorage 28
First F 0-5 Short 12871 km



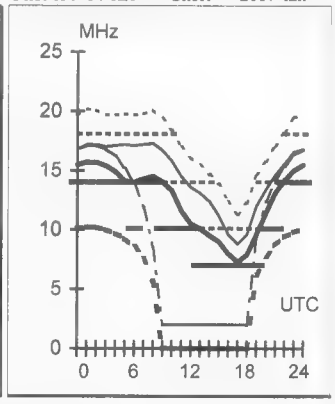
Melbourne-Chicago 67
First F 0-5 Short 15568 km



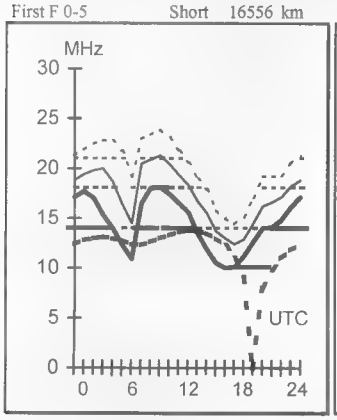
Perth-London 133
First F 0-5 **Long** 25543 km



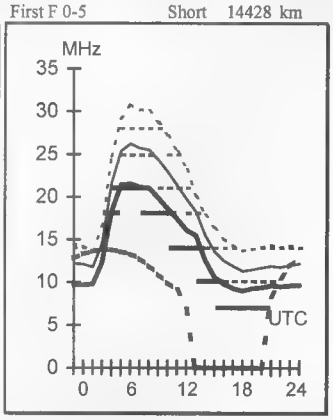
Sydney-Invercargill 139
First 1F9-14 1E0 Short 2017 km



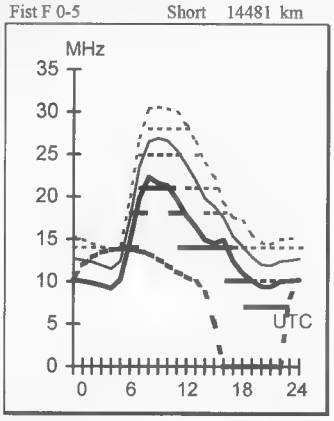
Hobart-Dakar 209
First F 0-5 Short 16556 km



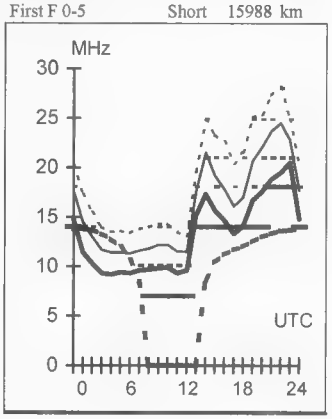
Melbourne-Moscow 316
First F 0-5 Short 14428 km



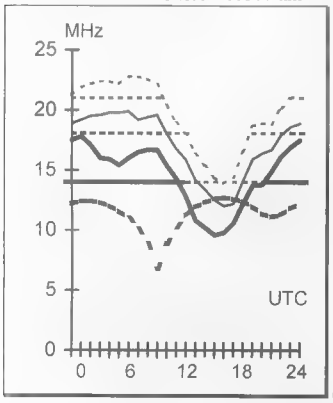
Perth-London 313
Fist F 0-5 Short 14481 km



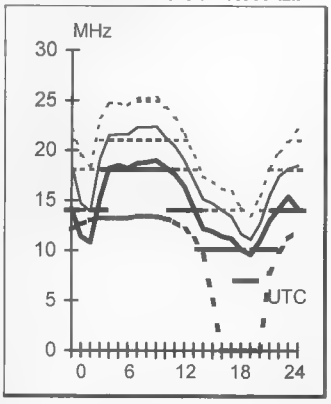
Sydney-New York 66
First F 0-5 Short 15988 km



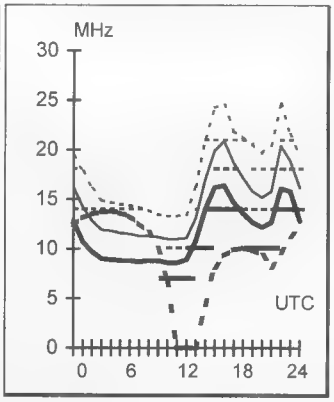
Hobart-Montivideo 161
Second 4F5-7 4E0 **Short** 11044 km



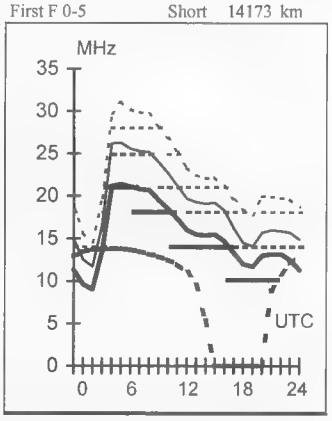
Melbourne-Nairobi 258
Second 4F3-7 4E0 Short 11501 km



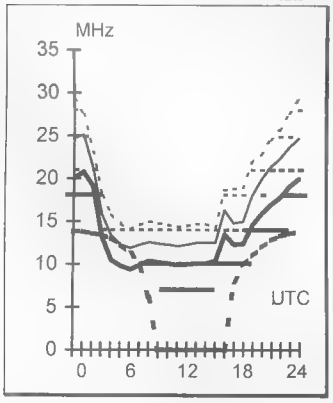
Perth-Ottawa 30
First F 0-5 Short 18212 km



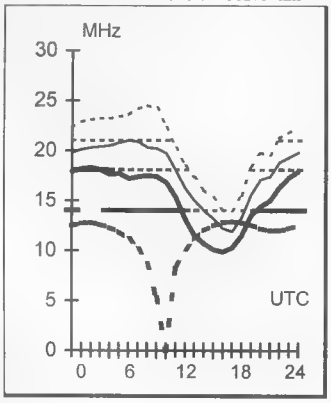
Sydney-Tel Aviv 287
First F 0-5 Short 14173 km



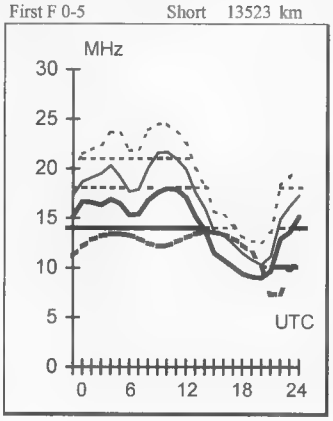
Hobart-Vancouver 49
First F 0-5 Short 13427 km



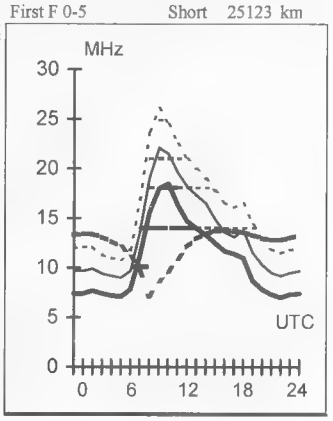
Melbourne-Santiago 150
Second 4F3-6 4E0 Short 11273 km



Perth-Rio de Janeiro 203
First F 0-5 Short 13523 km



Sydney-St Petersburg 143
First F 0-5 Short 25123 km



Hamads *classifieds* FREE

FOR SALE NSW

• **Vertical antenna CHA250B** 3.5 to 57 MHz, no radials, as advertised in AR. Virtually never used - not allowed in retirement village. $650. David VK2BDT 02 4821 5036

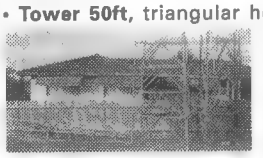
• **Marconi auto tune FM/AM modulation meter TF2304** s/n 169711/027, original handbook $230. John VK2BJU 02 4841 0272 or demerland@goulburn.net.au.

• **Shack clearance, VK2KVJ Cyril:** Kenwood **TS-830S x/ceiver** 240volt 1.8 to 30 MHz; Kenwood **TS-180 ant tuner**; Kenwood **TR-2400 2m FM x/ceiver** handheld; Kenwood **VB-2200A 2m FM power amplifier**; Alinco model **DR119 2m FM mobile** with hand mike; Phillips **FM900 x/ceiver** converted to 2m FM; Yaesu **FRG-7** communications receiver HF 0.5 to 30 MHz; Trio model **9R-59DS communications receiver** HF 0.5 to 30 MHz; **Midland HF power/swr meter**; SEIKO Transistor **24 hour World Time Clock; Baycom modem; PMG morse key 8 AMP No 2** (1942); Antenna switch **4 position model D-5204; Sony Stereo tape recorder model TC 540** (solid state); ***ARRL Antenna Book 16th edition; 1975 Radio Amateur's Handbook; 1993 Passbook to World Band Radio; 2001 World Radio and TV Handbook. All items are open to reasonable offers.*** Contact Ron 02 9525-8035 or email vk2gps@hotmail.com.

• **Yaesu FRG 7** communications receiver, VGC, S/N 6 MO 61926, $80; **Yaesu FT 720RV** 2 metre transceiver, removable front, with cradle, remote cable, manual, VGC, S/N OI 060774, $175; **Kenwood HF Transceiver, TS 50S**, as new, operating and maintenance manuals, S/N 41122062, current model, $700; all ONO; Keith VK2AXN, QTHR, Sydney, kandpa@bigpond.com.

• **SHACK CLEARANCE: Yaesu FT-100D** hardly used, with separation kit YSK-100, complete $1400. **Yaesu FT-290RMkII** with **Yaesu FL-2025** linear amplifier,mobile cradle,complete $390. **Yaesu FT-90R** dual band with YSK-90 separation kit, complete $395. **Yaesu FT1500M** 2m mobile, impeccable, complete $300. **Alinco DR-590** dual band in very good conditions $230. Mirel VK2BOD. Email adslqls8@tpg.com.au, Phone 02 4333 1823

• **Tower 50ft**, triangular heavy duty tower



made from heavy duty BHP Steel construction in 6 x 8'6" lengths + centre pipe. Each section cross braced for extra strength. Galvanised – no rust. Capable of holding VERY LARGE antennas. Comes with extremely heavy duty footings made from 1" plate steel and hinged. The tower is currently dismantled to its 6 parts and is located in Lawrence NSW. An 8 x 5 HD trailer is required to transport. Must sell – house sold. Cost $350.00 ONO You couldn't buy the steel for this price! Ph 0427 250 005, Max VK2KLW

WANTED NSW

• **Kenwood AT-230 antenna tuner.** Similar unit would be considered. Ken, Phone 02 6331 3335

• **Self-supporting wind-up and tiltover tower** for large HF beam. **Heathkit RX-1** receiver and **Hallicrafters SX-111**. Greg Price VK2GWP QTHR vk2gwp@bigpond.com.au, call Greg on 02 4958 1541

FOR SALE VIC

• **Early model TVs**, Astor SJ & HSQ, Kriesler 121, Philips 71, Rank Arena C2601 & C2605 for a collector to pick up as freebees or they go to the tip. Bill VK3ZWO, Sandringham, 03 9598 6304.

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• **GX2000 UHF mobiles** 25W suit 70cm, several available, $199. Bruce VK5VK 08 8298 3906, email rfwizard@optusnet.com.au

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• **Wanted Kenwood TS850s**, late model, preferably with narrow CW filters and DSP100 accessory. Good condition only. Contact Phil, VK6ABL, phone 0419 136 066, email:-flinders@gidgenet.com.au

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WANTED MISC

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VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

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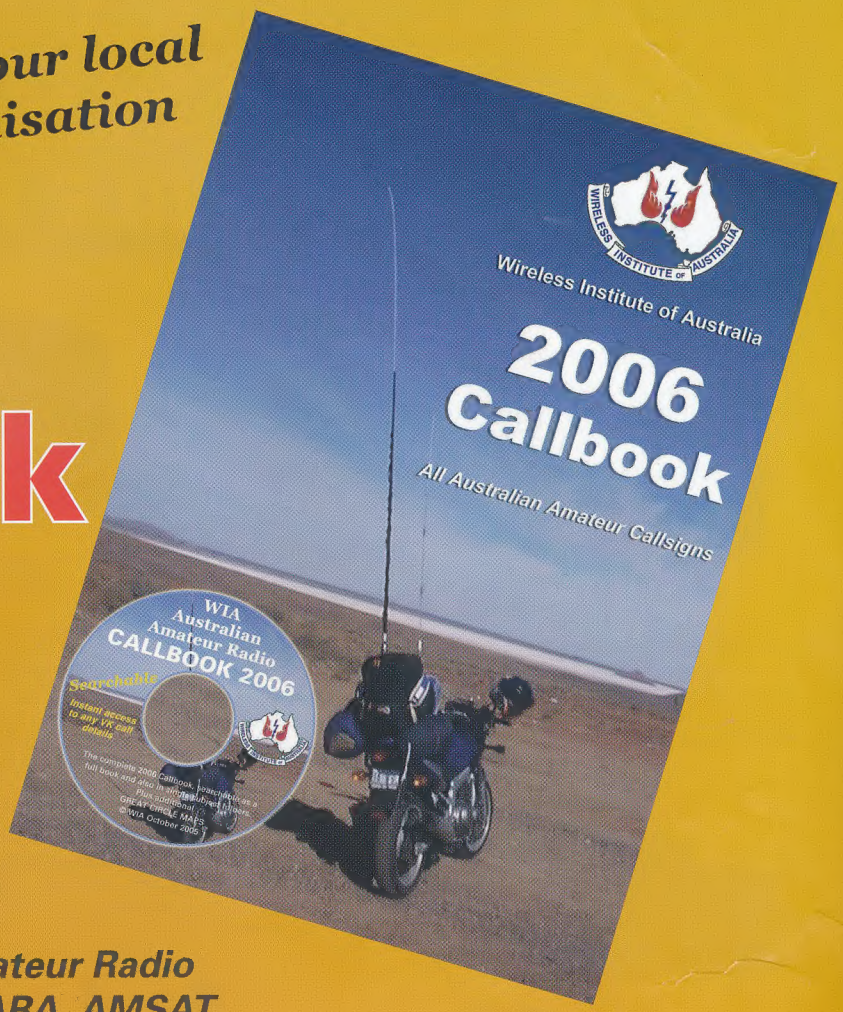

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